Better Crops with Plant Food

JUNE 1927 10 CENTS

THE POCKET BOOK OF AGRICULTURE

Foreword

THIS is the first issue of BETTER CROPS WITH PLANT FOOD.

BETTER CROPS began publication in September, 1923, and PLANT FOOD came into print in January, 1926. The former was issued monthly and the latter every two months.

The mission of the two magazines has been virtually identical—to serve the agricultural leaders of the country, first, by publishing sound, dependable information on crops and fertilizers and, second, by acting as a forum through which authorities might exchange opinions and give others the benefit of their experience.

This similarity of aim, together with the fusion of the scientific and agricultural departments of the German and the French Potash interests, has made the combination of the two magazines advisable. It is hoped this will result in a more efficient service and a bigger and better publication.

BETTER CROPS WITH PLANT FOOD will strive to promote and maintain an interest in factors pertaining to a more profitable agriculture.

Sound agricultural research and experimental work is one of the most important of these factors. It will therefore be the policy of this magazine to actively support all groups and agencies doing such work and cooperate heartily with the agencies that carry the results to the farmer.

In working toward these objectives BETTER CROPS WITH PLANT FOOD will constantly strive to be interesting, attractive, and thoroughly dependable.

This first issue is dedicated to the far-seeing and untiring work of the county agricultural agents in building a permanent basis of prosperity for our national agriculture.

BETTER CROPS
with
PLANT FOOD

The Pocket Book of Agriculture

The Whole Truth — Not Selected Truth

R. H. STINCHFIELD, *Managing Editor* SID NOBLE, *Editor*

EDITORIAL OFFICES: 20 *West 45th Street, New York.*

VOLUME IX NUMBER ONE

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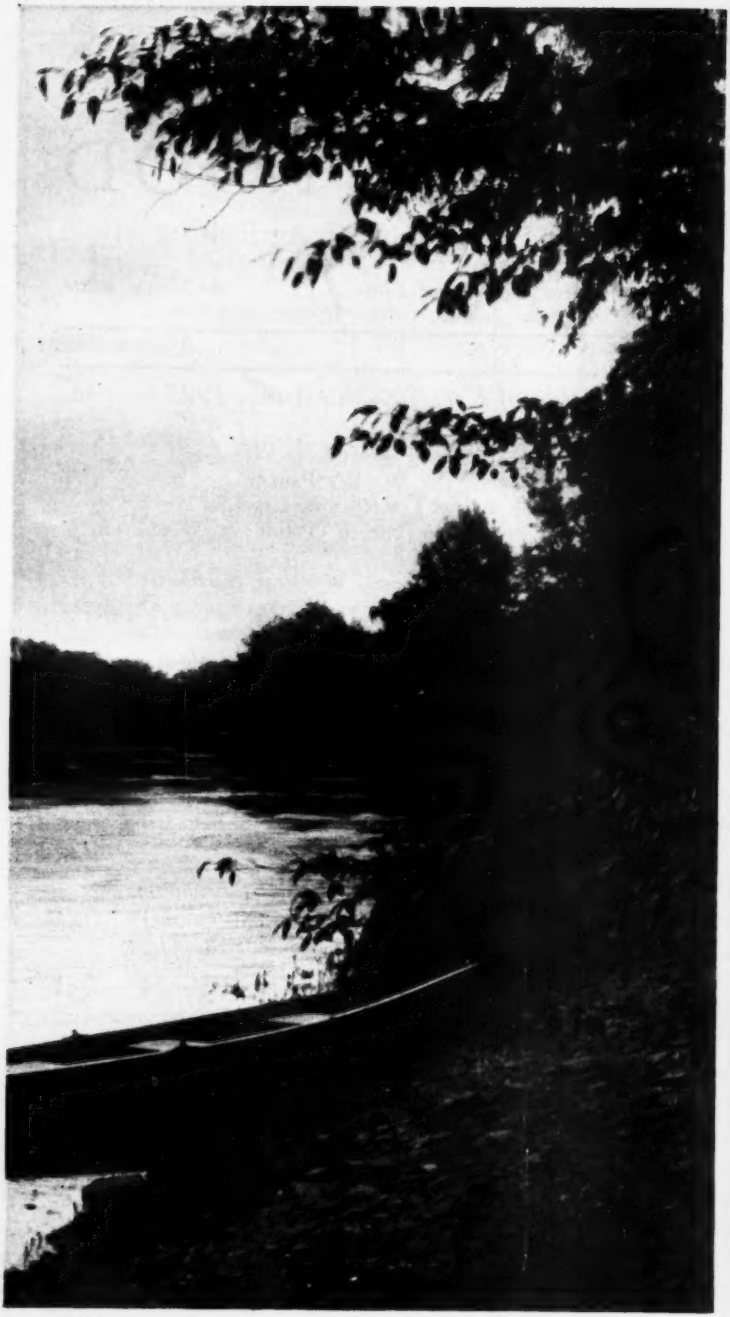
Agricultural and Scientific Bureau

Directors J. N. HARPER G. J. CALLISTER



Better Crops with Plant Food

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TIME

By Jeff McDermid

¶ We share it equally, he says.

"I HAVE no time," is an expression I used today, and half an hour later I told another fellow, "There's plenty of time for that!"

In the first instance I was asked to serve on a committee, and in the second instance somebody suggested going to a show around the corner.

The committee accomplished a fine piece of public spirited service and got their pictures in the paper with a puff two columns long. The variety show we attended was a perfect flunk and I had to pay for the seats.

At the beginning of that day I had a perfectly normal balance of time in the bank, but by one lost opportunity and one poor investment I came out of the day's transactions no further ahead.

Analyzing still further, it seems that the committee got along very well without me, and the show would have gone on to its dismal ending had I not been a suffering listener.

Had I turned down the chance for amusement as I refused the opportunity for service and its attendant renown, I could have gone home and put up the 44 window screens or used my energy and time at some other useful suburbanite stunt.

There is nothing calling for finer discrimination or more common sense than the use of time—yours or somebody else's supply.

Yet, look once more at time—not at *the* time as indicated more

or less accurately by your watch—but *time* as a great universal element, a factor of utility, the period in which things are, have been, or will be.

Time is the one thing that links the hoary past with the fervid present. The primitive man, the aborigine, the pioneer settler, the modern citizen, all had the same time to use, no longer or shorter, just as irksome or just as fleet in passing.

Invention has given us better ways of using time and saving time, but it has done absolutely nothing about time itself. The periods of daylight and darkness still vary only with the motion of the earth, and science has not given modern man any more actual time or any less of it than Moses, Socrates or Napoleon possessed.

In the persistent use of time the ancient and medieval doers accomplished wonders at which some of our rapid transit and stenographic-dependent populace well might marvel.

The ancients built the pyramids, the Roman aqueducts, the Appian Way, and the Great Wall of China in less time than America is taking to solve the wet and dry question.

Marco Polo did more traveling and real transcribing than your modern globe trotter. Some of the ancient writers pounded out more facts on stone than many of our reporters can do over a cigarette and a Smith Premier—moment for moment.

Diaries are supposed to be handy records of debits and credits on the time sheet. Ever try to keep a diary of six lines a day, the kind you buy in December for a dime and lay aside about January 15th?

Samuel Pepys, a Londoner of Tudor times, kept a diary that I borrowed in four volumes at the library three hundred years afterward. It made me dizzy! He was not a bedridden eccentric with nothing else to do but write what he hadn't done. Pepys was a high mucky-muck in the royal navy and had his day in Parliament besides. He was as busy as any man in London, always counting his gains and losses carefully, always in the midst of the whirlpool; but never forgetting to write from 500 to 2,000 words in his diary every night for several years. And Pepys was half blind, used a scratchy quill pen, and scribbled in dim candle light in a cold room.

In looking over some documents in our state museum I found file letter copies in handwriting by the justice who framed the constitution, who was also a general, a foreign ambassador, a teacher, and the author of a scientific treatise on flowers. All this was done without a stenographer, a typewriter, a dictograph, an automo-

(*Turn to page* 61)

JEFFISMS

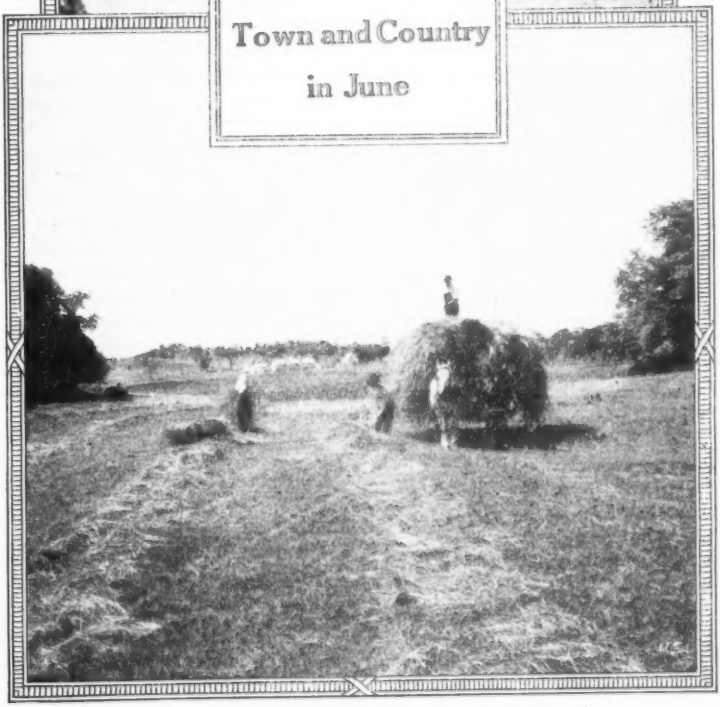
There is nothing calling for finer discrimination or more common sense than the use of time—yours or somebody else's supply.

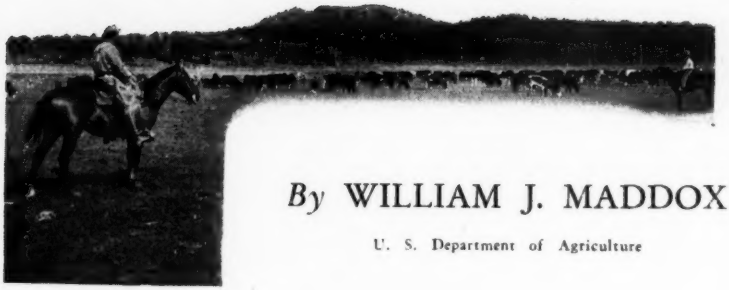
Time is absolutely impartial. Everybody has his equal share of it. There are twenty-four hours in the day for each and every inhabitant of the earth.

Punctuality and tardiness are the virtue and sin, respectively, of all time users.

We must take more time to enjoy time. After all, the time-shaver isn't always a time-saver.

Town and Country in June





By WILLIAM J. MADDOX

U. S. Department of Agriculture

Taking Inventory *of*

FROM his office in the world-famed grounds of the Villa Borghese, overlooking the city of Rome, an American—a former Texas farm boy—is directing the preparations for the world's first census of agriculture to be taken in 1930.

Never before has a world-wide survey of food-power been attempted. But it is an inevitable step in the economics of feeding the fast-multiplying populations of the earth, with its increasing perplexities. The time has passed when it was purely a national affair if our wheat crop suffered from bad weather. Today the effect is felt on the other side of the globe.

That is why the International Institute of Agriculture at Rome—a real league of nations supported by some threescore governments, including the United States—has decided upon this unique departure.

Naturally, being one of the world's great exporters of agricultural products, the United States is interested in the undertaking. It is, too, one of the chief contributing members to the support of the Institute.

Sentimentally, of course, there is the fact that Leon M. Estabrook, better known as chairman of the United States Crop Reporting Board, is directing the work. His selection came as a deserved recognition for what he has done to perfect the science of crop estimating. Several hundred candidates representing about all the member countries were under consideration, but the Institute finally went outside the list and named Mr. Estabrook.

THIS is not the first time that Mr. Estabrook's services have been called for outside the United States. In 1923, the Argentine Republic borrowed him for the purpose of developing a crop reporting and statistical system for its rapidly expanding agriculture. Mr. Estabrook was engaged in this for something more than a year, and before returning to the United

¶ The first world census of agriculture will be taken in 1930.

the WORLD'S PANTRY

States he took advantage of his presence in South America to make a statistical survey for his own government.

Mr. Estabrook's work was so satisfactory to all interests there that the Argentine government tried to induce him to stay. But he had other plans for himself.

And in a way the forthcoming world census is the realization of a long cherished vision, although for his part in such an enterprise he had scarcely expected to take the leading role.

Like a number of other far-seeing economists, Mr. Estabrook has been advocating a world survey of food power. He has looked for it as the next logical step in solving the world's food problems. Moreover, he insists upon its being taken at regular intervals, say every 10 years, as our own national inventory is taken.

It was this the Institute had in mind in selecting 1930, our next

Leon M. Estabrook is directing the first world survey of food power.

census year. Other important countries use this decennial period. In this way the world survey will be practically simultaneous with those of the individual countries, at least the more important of them.

This is necessary, for it is from these individual collections of statistics that the Institute is to get its data. And right here is one of the stimulating effects of the census. A number of countries either take no agricultural census or collect data that are for various reasons incomplete or useless.

BETWEEN now and 1930 this must be remedied, if the survey is to be a real world affair. And this is Mr. Estabrook's job for the next several years. Those countries that take no agricultural census must be persuaded to do so. It is Mr. Estabrook's task to study their individual needs and work out a system suited to each one. Those that have faulty methods of making surveys must be induced to change—and Mr. Estabrook must not only provide the persuasion but also the remedy.

The thought of a world census of food naturally brings up the old speculation about the world's ability to feed itself in the years to come.

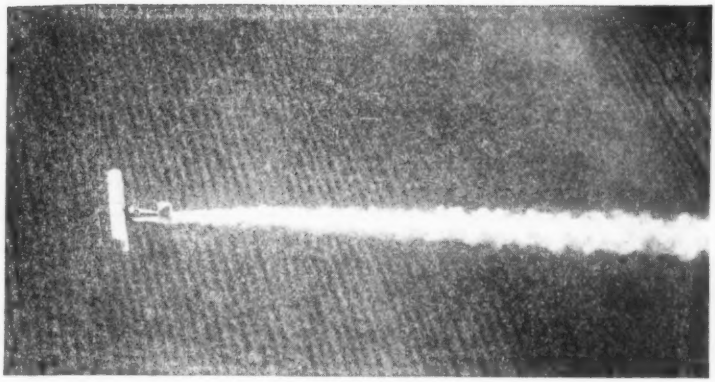
Unlike a number of agricultural prophets of some years back, and even today, Mr. Estabrook sees no cause for alarm over the future problem of feeding the world. We'll not go hungry, he says; and as for those to come, he points to the vast tracts of virgin land throughout the world that have never been touched. As population increases and the demand for food becomes greater, these will gradually be brought into cultivation.

But there is enough for so many generations that the question of a shortage of food is too remote to consider, least of all to worry about, he believes.

In South America alone, in the opinion of Mr. Estabrook, the world has a larder of untold possibilities. The rich soil of Brazil, in area equal to the United States, has hardly been scratched. Argentina, more than a third as large, is in its infancy of development.

Despite its Pittsburghs and its Detroits, the United States is still an agricultural nation, and is likely to remain so for a long time to come. "We are one country," says Mr. Estabrook, "that could build a wall about itself and let the rest of the world go hang, as far as our dependence on outside sources

Sheep in the Oregon National Forest growing mutton and wool for the world



An aeroplane dusting a large field of cotton in Southern United States

of food and clothing are concerned.

"Between the Atlantic and the Pacific and the Great Lakes and Mexico there is enough raised to clothe and feed us without importing a pound of food or a bolt of cloth. And we could stand a considerable increase in population at the same time," says this man who has had his finger on the pulse of our production for a good many years.

WHAT the proposed world census will reveal is looked forward to with much interest. Mr. Estabrook expects no startling revelations. There will be many surprises, he believes, but they will be of minor importance. The great good to come will be in the establishing of the machinery for collecting the information and in the fact that a beginning has been made.

Mr. Estabrook was born in Rockford, Ill., in 1869. When he was eight years old his parents moved to a farm in northern Texas. Until he was 21 years old he had less than three months of schooling. He then began the systematic education of himself at night, and for two years taught in the country schools of the State. Later he taught history, mathematics, physics, and rhetoric in the Texas University.

In 1893, he came to Washington, and for 10 years was a stenographer and correspondence clerk in the War Department. He entered the Department of Agriculture in 1904, becoming in a few months secretary to the chief of the Bureau of Plant Industry.

Later he was made chief of the Congressional seed distribution. He then became chief clerk of the department, and in the autumn of 1913 was appointed statistician and chief of the Bureau of Statistics, which he reorganized into the Bureau of Crop Estimates. Under his direction the vast government system of crop reporting was developed and brought to the high state of efficiency that has made it the standard of the world.

THE International Institute of Agriculture at Rome is an international clearing house for statistical and other information relating to the agriculture of all countries of the world. It had rather romantic beginnings. The two men

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Potash Fertilizers Jump Potato Yields In Wisconsin Tests

By F. L. MUSBACH

Branch Experiment Station, Marshfield, Wisconsin

LANGLADE county is one of the leading potato counties in Wisconsin both in yield per acre and in total yield. For the past two years an average of more than 1,000,000 bushels of potatoes were raised in the county. The yield per acre was 155 bushels as compared to 121 bushels for the State. Truly the humble tuber is an aristocrat in the crop family of this northern Wisconsin county.

The cool climate, productive soil, and abundant moisture during the growing season furnish ideal conditions for the spud crop. The Green Mountain is one of the popular varieties. The Irish Cobbler, Triumphs, and Rurals are also grown extensively. The seed trade is becoming an important outlet for stock that measures up to the requirement of the eastern and also the southern grower.

The soil is mapped Antigo Silt Loam by the State Soil Survey. It represents a plain-like formation originally timbered with mixed stands of hardwoods. The soil in the virgin condition is well supplied with the so-called plant food elements. Since the underlying rock is granite the soil is invariably acid.

The crop is grown largely as a side line with the more important business—dairying. There are, however, many growers who depend exclusively on the tuber crop for their sole income.

Both types of growers use fertilizers in liberal amounts and find them profitable. With the view of getting information as to effects of various combinations on yield and on quality, two field trials were conducted in 1926 with the assistance of County Agent John Omernik and the cooperation of the growers near Antigo.

ONE of these trial plots was located on a farm that might be described as employing the exclusive system of growing potatoes, while the other was on a farm using the diversified system. In the one case no manure was available while in the other dairying was important and manure was applied regularly in the rotation.

The treatments and results of the test of the exclusive system without stable manure are summarized in the accompanying table.

A second, light crop of timothy and clover was plowed under the preceding year. The fertilizer in each case was applied in the row by means of an attachment to the horse planter. The general retail

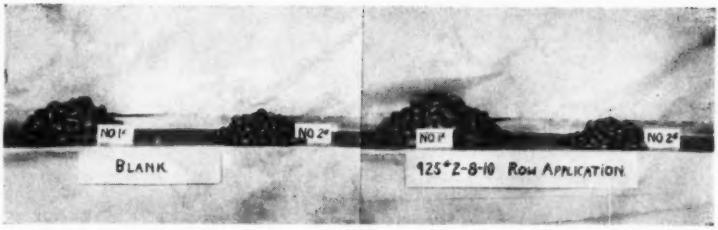

TABLE 1

Plot	Treatment	Total yield bu.	Per cent No. 2's	Increase of No. 1's over no fertilizer bu.	Return per A. above fert. cost
1	825 lbs. 5-8-7	280.6	21.7	106.5	$75.47
2	820 lbs. 2-8-7	269.6	22.6	95.5	70.25
3	925 lbs. 2-8-10	252.6	20.8	87.0	59.26
4	935 lbs. 2-8-3	240.9	26.6	63.8	41.06
5	1050 lbs. 0-8-7	222.0	23.6	56.5	34.63
6	925 lbs. 0-8-0	165.9	35.3	–5.7*	....
7	No fertilizer	171.0	33.8	....	....

* Decrease.

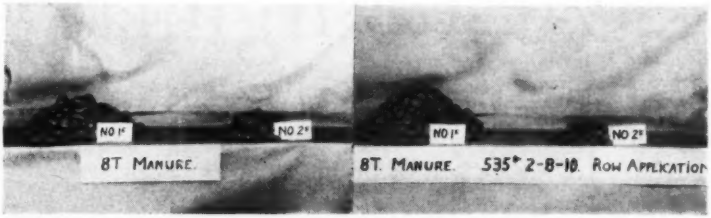

TABLE 2

Plot	Treatment	Total yield bu.	Per cent No. 2's	Increase of No. 1's over manure bu.	Return per A. above fert. cost
1	Manure, 535 lbs. 2-8-10	231.3	8.9	78.6	$59.84
2	" 590 lbs. 5-8-7	226.3	16.1	57.7	37.35
3	" 345 lbs. 0-8-7	222.2	16.5	53.3	42.64
4	" 375 lbs. 2-8-3	227.0	19.6	50.3	38.69
5	" 330 lbs. 2-8-7	209.0	18.5	38.7	28.51
6	" 525 lbs. 0-8-0	145.2	18.6	–13.9*	....
7	Manure only.	177.4	25.5	....	....

* Decrease.

fertilizer prices were charged, and 90 cents per bushel credited to the crop of No. 1's. The No. 2 stock was not considered in obtaining the acre return above fertilizer cost. Neither was any allowance made for the extra labor involved in harvesting the increased yields.

Each treatment, it will be noted, returned handsome profits except plot 6 receiving acid phos-

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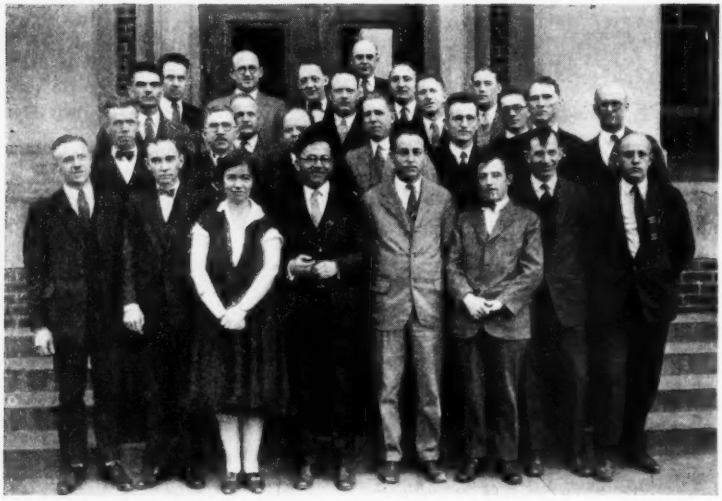

The Director of the West Virginia Experiment Station and part of his staff

West Virginia

By H. G. KNIGHT *and* R. J. GARBER

Dr. Knight is Director and Chemist of the West Virginia Agricultural Station and Dr. Garber is Head of the Department of Agronomy

ESTABLISHED in 1889, the West Virginia Agricultural Experiment Station during the period of its existence has had a direct influence on the agricultural practices of the State. In addition there is the intangible influence making for progress which is less readily apparent but none the less real.

These influences may be pointed out specifically in many ways. Important is the encouragement which the Station has lent in the introduction and cultivation of crops not formerly raised in the State, such as cowpeas, soybeans, alfalfa, and others. The Station has standardized to a degree the varieties of old crops by pointing out those which were best adapted to the conditions of the State. It has stimulated the use of fertilizers and determined methods of culture best adapted to the various crops.

In the field of horticulture it has made available to the fruit growers information of a similar nature and has also taught them how to prevent injury to the fruit from diseases and insects and how to pack and market fruit and how to best prune trees. In fact, it would be extremely difficult to estimate just how much the Station has had to do with the development of the tremendous fruit

industry of the State which has reached its most extensive proportions in the Eastern Panhandle. The less spectacular potato industry, the most important phase of truck crop raising in this State, has received its share of attention from the Station and has reaped its proportional benefits.

DIRECTORS

John A. Myers
(*1889-1894*)
James H. Stewart
(*1894-1911*)
E. Dwight Sanders
(*1911-1916*)
John Lee Coulter
(*1916-1922*)
Henry G. Knight
(*1922-*)

The livestock problems have not been neglected. Cattle, hogs, and sheep, the main classes of livestock in this State have been studied, especially from the point of view of determining the best feeding methods and the best means of improving the quality of the animals. A direct and very visible result may be seen in the rapid replacement of scrub animals by herds and flocks of purebred or high grade stock.

The encouragement of the use of purebred sires has been largely responsible for the improvement and it has been one of the accomplishments of the Station. Much of the area of West Virginia is better adapted to sheep raising tnan to any other branch of agriculture and the encouragement of this industry has long been one of the concerns of the Station. Dairying, long neglected, is gradually being built up into a major industry and the results of experimental work deserve a large share of the credit.

Poultry raising, formerly a side line on the farm, has developed into a major industry almost directly as a result of the dissemination of information as to breeds of chickens best adapted for egg

The main building of the West Virginia Agricultural Experiment Station

production and as to proper feeding, housing, and management of flocks.

The problems incidental to the production of field crops in West Virginia are so closely associated with those incidental to the production of livestock that both should be solved simultaneously in order to bring about a proper agriculture. It was with this viewpoint that the investigational work in agronomy was planned and carried on by the Agricultural Experiment Station.

ONE of the factors limiting the normal expansion of livestock farming in West Virginia, is the production of sufficient roughage to carry animals in good condition from one grazing season to the next. Not only should there be sufficient roughage but it should be of high quality.

The soybean, introduced rather recently, has helped very materially in solving this problem. The Experiment Station is carrying on numerous investigations with this valuable legume. Some of the experiments which are now under way are variety trials, rate and date of seeding, effect of soybeans on crops that follow, effect of lime on growth of soybeans, relative yield of soybeans for hay when grown in rows and when grown solid, and relative yield of soybeans grown with each of the following crops: corn, sudan, millet, and amber sorghum. In addition, experiments in soybean breeding have been under way for some time. As a result of plant selection two new strains have been isolated which give considerable promise in comparison with standard varieties now grown.

In a survey of pastures made in several counties of West Virginia a few years ago, it was found that the carrying capacity of the average pasture was low. Both planned experiments and the experience of farmers have shown that the carrying capacity of relatively unproductive pastures may be doubled easily by the proper fertilization. This fact is of considerable importance not only for the cattleman and sheepman, but the dairyman as well. In fact the dairyman can probably spend, economically, more than livestock men for pasture improvement.

The question of producing ample succulent feed to maintain the milk flow during the winter months is frequently before the West Virginia dairyman. Corn silage is perhaps the best recognized feed of this nature. Numerous investigations have been carried on to determine the highest yielding varieties of corn for silage that are commercially available. Sunflowers have also been studied with the aim of ascertaining their value for silage production. The problem of producing more succulent feed per acre is also being attacked from the standpoint of plant improvement. A rather extensive project in corn breeding which is now under way has for its object the production of a high yielding strain of corn from the standpoint of forage that is at the same time resistant to smut.

WITHIN the last few years a number of crop rotation investigations were begun. The effect of lime on cropping, the value of different cover crops, a comparison of livestock and of grain systems of farming, and a comparison of different crop rotations are some of the objects of this experiment. The investigation is being carried out on second bottom land near the Ohio river and although the work was just started recently there is already apparent

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One of the largest cotton warehouses in the United States, located in New Orleans, uses the federal warehouse receipt.

Heading Off That CREDIT SQUEEZE

By ARTHUR P. CHEW

United States Department of Agriculture, Washington, D. C.

KEEP your eye on the intermediate credit system which has been set up under the agricultural credits act of 1923. It is working a revolution in farm financing. Competent observers who have watched the operations of the system since it was quietly launched in June, 1923, predict that it will bring about changes in agricultural finance as important and as far-reaching as those introduced into commercial credit and banking by the Federal reserve system.

The system consists of 12 intermediate credit banks located in the same cities and having the same officers and directors as the Federal land banks. You may not hear much about these institutions. They are not authorized to deal directly with the farmer, but must function through commercial banks or agricultural credit corporations. Farmers, therefore, are not very likely to have their attention drawn to the intermediate credit banks and know little of them.

But they are functioning just the same. Their direct loans outstanding on September 11 amounted to $34,419,618 and their rediscounts to $43,896,232. They made advances on wheat, wool, cotton, canned fruit, tobacco, red top seed, broom corn, raisins, rice, and other storable farm products. When the War Finance Corporation ceased making advances, the intermediate credit banks took

over a large part of its business.

These banks are playing an increasingly important part in our agricultural economy. Their operations are nation-wide. Their direct loans to cooperative associations in 1925 aggregated $124,175,009. This figure included $2,000,000 to wool cooperatives. Rediscounts for banks, credit corporations, and livestock loan companies totaled $53,458,000. Rediscounted livestock loans during the year exceeded $28,000,000. Of the rediscounts outstanding on December 31, 1925, about $8,203,710 was secured by cattle and $6,561,264 by other livestock, principally sheep. Don't forget, too, that the rediscount rate was only 5 per cent. That meant that the maximum interest rate to stockmen on their rediscounted paper did not exceed 7½ per cent. Cooperative associations, of course, got the straight 5 per cent rate on direct loans.

MORE important than the mere fact that the new credit institutions are making loans, is the manner in which they are doing so. Herein lies the secret of their epochal significance in the development of agricultural finance. They are making loans for terms corresponding with the farm turnover, and on conditions which obviate all danger of a sudden call for liquidation before completion of the work which the loans are intended to finance.

Nothing like this has been attempted before as a permanent policy. True, the War Finance Corporation made loans for longer terms than those for which agricultural credits are ordinarily granted. But the War Finance Corporation was designed as an emergency institution, destined for only a brief life. Though its mode of operation formed the model for the new intermediate credit institutions, it did not discharge the broad and varied functions which the latter seem likely to fulfil.

The new banks were organized to furnish agricultural credit for terms longer than those covered by ordinary bank loans, but shorter than those for which farm mortgage loans are usually made. That is why they are called intermediate credit banks. In the past there had been no regular source of intermediate credit for the farmer. He had to get along on three and six months' credits granted by the commercial banks. What this has meant every farmer knows.

It meant placing him at the mercy of the creditor, by requiring him to accept legal conditions of payment which the length of the farm turnover made it impossible to fulfil. The crop farmer's turnover is from six to twelve months. That of the livestock producer is from one to three years. Loans of short maturity are consequently unsuited to many agricultural needs. They would not do at all but for the fact that under ordinary conditions they are usually renewed. When, as happened in 1921, they are not renewed, there is grave and immediate trouble.

HOW dangerous and unjust the old farm financing plan is needs no demonstration. It exposes the farmer to the risk of having his loan called before he can pay it, and compels him to make an agreement as to repayment which neither he nor the lender expects to have kept in normal circumstances, and which can only be kept at hardship and loss to the borrower. Only one defense of such a system is possible, and that is that it was unavoidable.

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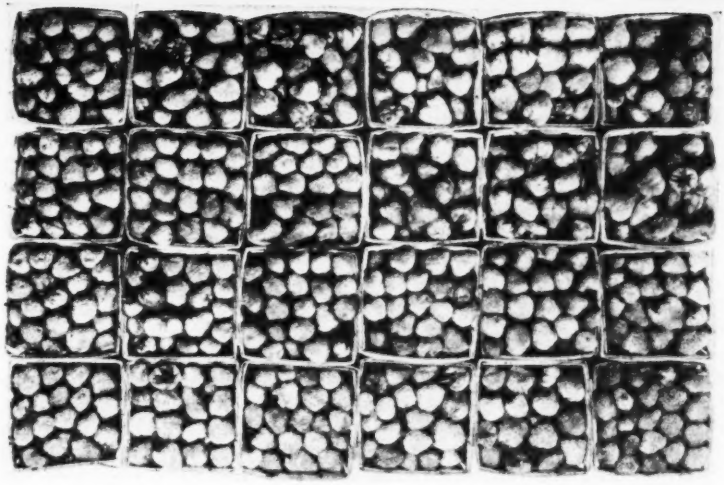

The Crimson Carpet of TANGIPAHOA

By SID NOBLE

IT'S harvest time in Hammond, "Strawberry Capital of the South." Down in Louisiana, in the parish of Tangipahoa, the berries are ripening and everybody is busy. From late February until early June, during the marketing season, the pickers are out in the early morning, gathering and crating the day's crop, preparing it to be trucked to town for shipment. Each afternoon in Hammond and Ponchatoula, the principal shipping points, wagons and trucks wait their turn at railway sidings to have their luscious burdens inspected, graded, checked, and transferred to refrigerator cars. At seven-thirty each evening the drone of the auctioneer is begun at the cooperative auction in Hammond and the day's berries are sold while they are being carried northward by fast freight.

The successful bidders consign their respective cars to chosen markets and the next day the farmer gets his money, the amount of which is governed by the exact average per crate price of the night before. By this efficient method berries picked in Tangi-

pahoa on Monday morning may be served for breakfast in Chicago on Wednesday, in New York or Los Angeles on Thursday, or in Montreal on Friday.

The Farmers' Strawberry-Vegetable Auction, Inc., "largest distributors of strawberries in the world," operates in a unique building called "The Log Cabin," situated close by the railway station in Hammond. This structure is the show place of the parish and is built of virgin timber. Its ridge pole is a single straight tree trunk 85 feet long. The fact that more tnan 100 buyers from all sections or the country make an annual trek to this auction place to remain through the market season and bid on the crop reveals the important position occupied by Tangipahoa strawberries.

THAT strawberry production is big business in the Hammond district is again revealed by the total cash return from the crop which has come to amount to something like $5,000,000 each year. Last year 2,987 carloads of strawberries were shipped from five southern states and of this total 2,342 cars were shipped from the Hammond district.

The 1927 season gives promise of being a record-breaker. Due to a mild winter and the absence of frost during February, the first carload rolled from Hammond February 28, exactly one month earlier than the first carload in 1926. This early crop means that the growers should realize on some 500 cars in addition to the regular crop which comes on in early April.

Strawberry production has come to flourish on the 20,000 acres devoted to it in the Hammond district because of certain ideal conditions and factors. The soil of the district is mainly a Hammond silt loam, rainfall is frequent making fertilizer quick acting, there is abundant artesian water for irrigation purposes and plenty of pine straw for mulching the plants. The climate is favorable in that the berries are produced at a time when there is a minimum of competition from other sections, and transportation facilities are excellent.

BERRY growing is a year-round occupation and as soon as the crop is harvested work begins on the next year's crop. When the last crate has been shipped in May the strawberry field is barred off and scraped. Later it is cultivated and harrowed and about 300 pounds of cottonseed meal is broadcast. Runners come and new plants appear in about a month. Around July 1, after a rain, the plants are transplanted to new beds.

The plants are carefully watched in the beds and the runners are cut off until about the first of November when the runners are allowed to take root to form new plants for use. From the first of November until the first of December is planting time and the new plants are set 10 inches apart in 3½-foot rows in the field.

Eight to ten days prior to planting the fertilizer is put down by hand. The land is broken with a bull tongue plow, the fertilizer put down and covered with three furrows. There is no standard fertilizer mixture used generally by the growers. They use everything from a 10-2-2 to a 12-4-7 in varying amounts up to a ton to the acre. The Agricultural Extension Department of Louisiana State University says in a bulletin that the mixture which has given the best results is 1,300 pounds of acid phosphate (16 per cent), 500 pounds of nitrate (14 per cent),

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Ivan Morris, *Master Farmer*

Former School Teacher makes his vegetable farm pay $10,000 *a year*

By C. T. GREGORY

Purdue Agricultural Experiment Station

FOURTEEN years ago Ivan Morris was principal of a small school at Prairieton, Indiana, drawing a small salary. Today his income is more than $10,000 a year, made from his 144-acre vegetable farm. Twelve years ago the doctor told him he had six months to live, but today he is hale and hearty and as brown as a berry. Morris says, "Any man can succeed if he knows what he wants and works hard enough to get it."

As a school teacher Ivan was a success but his ambition spurred him to greater things. At the end of each school year he always went on the road as salesman for a Chicago firm. The money made this way enabled him to salt away most of his teacher's salary to satisfy that ambition. Nature precipitated things somewhat. His strength could not stand the pace and in 1911 he suffered a nervous breakdown, but he continued to drive himself. In 1912 and 1913 the same trouble recurred and it was at his last visit in 1913 that the doctor said, "If you continue at your present work you will be dead in six months." That is how Nature forced Ivan to carry out his ambition to own a farm.

In 1913 he purchased 16 acres of sandy land near Terre Haute and began business as a truck gardener. There were no buildings on the land, nothing but sand. His success is exemplified by the fact that today he has a fine home, a tenant house, and a large greenhouse. The reason for his success may also be seen in these buildings. His home is comfortable but not pretentious. His greenhouses are good enough to raise large and profitable crops,

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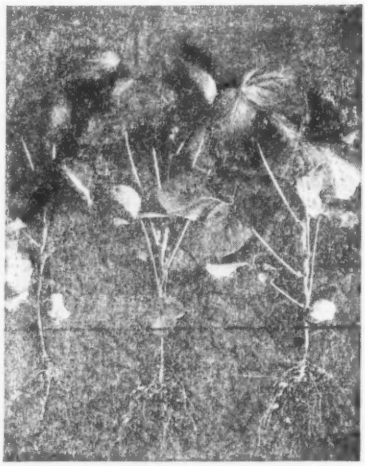
Soybeans

By GEORGE L. SCHUSTER

Agronomist, Agricultural Experiment Station, Newark, Delaware

FARMERS were just beginning to hear about soybeans in 1909. A few acres were grown in scattered districts. The agricultural census of 1910 did not include soybeans except in some of the southern states. The 1920 census reports a production of about 127,000 bushels for the States of Virginia, Maryland, and Delaware. Nothing is mentioned about those grown for forage. In 1924 there were approximately 420,000 bushels of seed grown and 95,000 tons of forage. The average farm price in 1913 was about $2.00 per bushel; the price increased steadily until it reached about $4.00 in 1920; and has since declined to about $2.50.



The average green crop of soybeans has 165 lbs. of nitrogen, 109 lbs. of potash, and 42 lbs. of phosphoric acid per acre in the tops; and 9 lbs. of nitrogen, 6 lbs. of potash, and 2 lbs. of phosphoric acid in the roots.

In a short space of 15 years a comparatively unheard of crop has risen to a prominent place in our agriculture. There are many instances where soybeans have been the only cash crop of any consequence the farmer had. They have been a godsend. In many instances soybeans have been substituted for wheat, during the declining prices of wheat, and for oats, because of greater production and feeding value, and now the European corn borer will be saying "grow soybeans instead of corn for I'm going to get your corn."

If the production of soybeans continues to increase as it has in the past, the price will probably decline still more. With a decline in price the margin of profit becomes less, and the only way to hold the margin of profit is to lower the cost of production and at the same time increase the demand for the beans.

THERE has been a decided profit in the past in growing soybeans for seed, but as the acreage has increased the profit from that source has decreased. The soybean, however, may be utilized in many different ways ranging from soil improvement to the manufacture of paints, varnishes, stock feeds, vegetable milk, and salads. Soybean hay is equal to, if not better than, cowpea, alfalfa, and red clover hay. Soybean straw has been

Left: Without fertilizer or lime this plot gave a net return per acre of $35.80, with lime the net return was $35.59.

Right: With acid phosphate, muriate of potash, and no lime this plot gave a net per acre return of $61.00, with lime added the return was $59.55.

Left: With complete fertilizer and no lime the net return was $67.01, with lime added the return was $68.47.

Right: Net return per acre with manure and no lime was $68.63; with lime added, $63.03.

found superior to corn stover in the production of milk and butterfat by the Tennessee Experiment Station. The straw when used as a fertilizer has been found to be superior to wheat, or rye straw.

Soybean meal contains about the same amount of protein as cottonseed and flaxseed meal, and a little less fat. Indiana feeding tests show that hogs fed soybean meal in connection with corn made more rapid gains at less cost than when fed linseed meal. The North Carolina Experiment Station found that soybean meal made quicker gains on young chicks than rolled oats when fed in connection with wheat shorts, cracked corn, and sweet milk.

Soybeans as a source of vegetable protein are not surpassed by any other crop in such a wide range of adaptability. Protein feed is high and when such feed costs exceed the price of soybean seed it is better to produce your own protein by growing soybeans.

ONE often hears of crops that are recommended for poor rundown soil. The soybean has been put in that class. To be sure the soybean is a good soil improver, but there isn't any cultivated crop but what will do better under proper cultural conditions. Don't grow soybeans for soil improvement and expect a high yield at the same time.

PROPER consideration must be given to the selection of a suitable variety, inoculation, preparation of seed bed, fertilizer, and other soil amendments if the soybean is to perform at its best. The Delaware Station has some interesting results with fertilizers on the Wilson variety of soybean grown on sassafras silt loam soil. A summary of the results is given in the accompanying table. The beans were grown in a four field system of: 1, corn followed by a clover crop; 2, soybeans; 3, wheat; 4, clover and timothy. Lime has not been an important factor in the production of beans. Soybeans do not require as much lime as red

(*Turn to page* 56)

Soybeans and Sudan grass make good hay, many times used in an emergency.

New Corporation Will Sell Potash In this Country

Offices have been opened in New York, Baltimore, and Atlanta by N. V. Potash Export My.

THE N. V. Potash Export My., which has recently been organized in Amsterdam, Holland, for the sale of foreign potash salts in the United States and other countries, has opened a branch office in New York, effective May 20, at No. 20 West 45th Street, New York City, under the joint management of R. Kunze and R. Gide, who have been appointed managing directors for the United States, Canada, Cuba, and Porto Rico.

This new organization will sell to the American fertilizer manufacturers the potash salts produced by the German and French potash mines, whose business has heretofore been handled for the German interests by the Potash Importing Corporation of America, and later—after the completion of the Potash Importing Corporation's contract—by R. Kunze, and for the French potash mines by the French Potash Society.

Mr. Kunze has been associated with the German Potash Syndicate as the Director for the American business for many years, and is well known to a large number of the American fertilizer manufacturers, as well as to the chemical industry; Mr. Gide has had charge of the French Society in the United States for a number of years, and is likewise well known to the trade.

The Corporation has secured the services in the sales department of W. B. Howe, who has been general sales manager for the French interests in the United States since the opening of their offices in 1921, and C. C. Smith, who for many years prior to the war was general sales manager of the German Kali Works.

There will be connected with N. V. Potash Export My., a fully organized agricultural and scientific bureau. J. N. Harper whose work in the service of the Soil Improvement Committee of the National Fertilizer Association and the French Potash Society is well known, and G. J. Callister who has been engaged in agricultural work for the German Potash interests for the last 16 years, will be in joint charge of the agricultural and scientific activities of the organization.

The entire personnel of the new corporation has heretofore been connected, in this country or abroad, with the potash business.

Wanted: *A Soil Fertometer*

By IRVIN J. MATHEWS

Winamac, Indiana

¶ *Here's a farmer who keeps books on the fertility of his fields.*

I HAVE studied organic and agricultural chemistry. Also coming within the range of my academic studies are soils and fertilizers, crop rotations, soil physics, and the like. In common with most others who have made similar studies, the first effect was merely a fog-bank of ethereal chemical formulae which later cleared away leaving a heavy realization that of all the individual practical problems of the farmer, the fertility maintenance problem is by far the most important, albeit the least understood.

For some years now I have been applying what means were at my disposal to the dirt-farm solution of this problem. I am the kind of farmer that lives on his own farm, spreads his own limestone, sows his own alfalfa seed, and feeds his own steers and hogs. The Y where theory and practice meet has long since been passed and I can state the problem as it has finally cleared up in terms so plain that any one can fully comprehend it. More than that, practices that I have found profitable and efficacious in reclaiming a farm whose fertility had been mined for 25 years certainly will maintain and enhance the fertility of a farm that is now fairly productive.

There are two phases of the problem: I, The problem itself and II, Practical methods of maintaining soil fertility.

Fact 1. Soil fertility (plant foods such as nitrogen, phosphoric acid, and potash) is the real basis of productive, practical farm operations. Plants alone can utilize soil fertility, crops are the only livestock feed there is, and commercializing end-products of either plants or animals embraces the sum total of agricultural pursuits and about 90 per cent of all human endeavor.

Fact 2. Average farming is mining, pure and simple. Up to the present, American agriculture has consisted largely of mining and giving away plant foods.

Fact 3. Farming, to become profitable on individual farms. must be reorganized so as to market "management" rather than plant food.

PERHAPS a little history will not be amiss. For six years I was a county agent. The county in which I operated then and now live (Pulaski county, Indiana) has several soil types from blow sand to deep muck and peat. During the six years my counsel was given largely from the academic point of view. However, after a while my family increased so that I could no longer afford the luxury of a county agent's salary and position, and so I bought a farm whose main qualification was that it had a long frontage on the Tip-

pecanoe River, one of the prettiest rivers in America, I may add with genuine Hoosier pride.

I was fully aware that this was not a first-rate farm. Buildings, there was none that could be called by the name, and fences were simply trails of rust that served only to make one leery of where he drove his auto. The horses found it quite possible to stray anywhere they wanted to.

THIS farm had been literally skinned for 25 years prior to this time. Once fertile acres had become barren. The fertility had been mined and sold at the elevators, all of which I soon discovered, and it was not a pleasant surprise to one who had sunk his lifetime savings in such a bottomless pond with a second mortgage put on the place as security for more capital. I may state, however, that the second mortgage is now dispersed, largely with returns from this farm secured during a period when older and well established agricultural "plants" have been crying out for legislative succor of one form or another. Out of the dire need of "getting by" has come a clear vision of the fertility problem and the idea that making money comes from selling management rather than plant food.

FARM bookkeeping is the most difficult of all business calculations. One can rather easily keep a statement of all income and outgo in terms of money, but I endeavored to keep a specific statement of the income and outgo from the farm in terms of fertility. What a difference! When 10 two-year-old steers that have gained a total of 1,500 pounds go to market, the evaluation of the nitrogen, phosphoric acid, and potash which they are ambling away with is another matter.

You drive these steers to the shipping point. How many pounds of sulphate of ammonia, 16 per cent acid phosphate, and muriate of potash should you bring back home with you in sacks to replace what these cattle have used up in the feed given them? This trial plant food balance that I draw frequently I call my "fertometer."

I trust that some time some scientific genius will invent a mechan-

Mathews Manor, the comfortable home of a successful Hoosier farmer

Movable stack bottoms serve as pig creeps in summer. Note slide door for easy cleaning and adjustable size entrance.

ical soil fertometer that you can thrust down into the soil like a thermometer and it will register the fertility of that soil. However, feeling that such a thing may be some little distance in the future I keep my fertometer which I work on occasionally to see that the plant food balance in my soil is increasing rather than decreasing.

If farmers generally would keep such a balance, the price for agricultural products might change in a short time. Economists assert that the average price over a period of years has a tendency to hug rather closely the average conscious costs of production. It, therefore, follows that since farmers in general have taken no thought of the plant food mined which entered into their production costs, average prices have not included these costs.

PLANT food is the basis of agricultural production just as the rock is the basis for a house. A house built upon the sand—well, St. Matthew 7:27-28 (no relationship claimed) gives a pretty good idea of what eventually happens to it and the same calamity befalls the agriculture that is not built upon the foundation of maintained soil fertility.

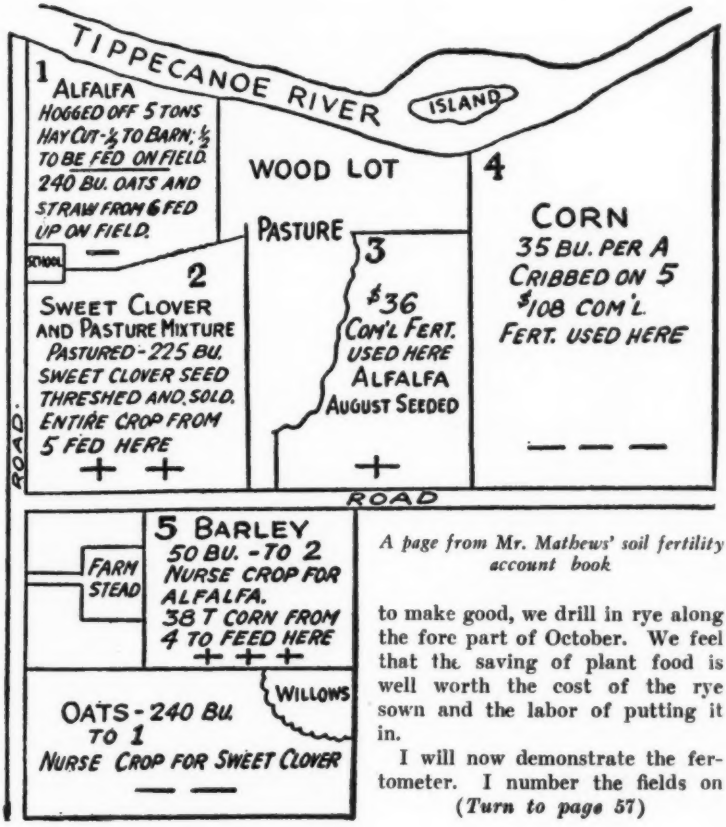
Put it another way, the soil is merely a plant food self-feeder which contains among other things, nitrogen, phosphoric acid, and potash, either put there by a provident Nature or by the hand of man. Nature does it more easily than man, I should say from experience. The plant standing on top of this self-feeder reaches down and takes what it needs of nitrogen, phosphoric acid, and potash just as the pig that comes to his self-feeder and eats what he needs of corn, tankage, and salt. If the pig finds the feeder completely empty or one of the compartments empty, he merely adjusts his growth to meet the supply. The crop does the same thing.

I am sometimes away for a few days, and I instruct my aids to see that the compartments in the self-feeders are always full of these three essential pig feeds. That way grows the biggest pig in the fewest days.

Every locality has a more or less

definite growing season, sometimes shortened a little by a late spring frost or an early fall frost, but with a tendency to show little variation. By keeping the soil well supplied with these plant foods, we get the biggest plant in the number of growing days that our location gives us. When the pig is marketed, we scoop up what tankage is left in the feeder because that will spoil if left unprotected in the feeder, while the corn and salt keep for a long time just as they are. Just so in a practical way, we always plant alsike and timothy with a sweet clover because the sweet clover normally dies in August its second year and much of the nitrogen it has fixed is lost unless we have the timothy and alsike right on tap to take up this nitrogen freed by the rapid decomposition of the sweet clover roots.

NO soil on this farm is allowed to lie bare during the winter. Cultivating the corn liberates a liberal supply of plant food, a part of which must eventually follow the tiles to the river if not attached. Accordingly, we sow sweet clover in the corn field just before the last cultivation. If this fails



A page from Mr. Mathews' soil fertility account book

to make good, we drill in rye along the fore part of October. We feel that the saving of plant food is well worth the cost of the rye sown and the labor of putting it in.

I will now demonstrate the fertometer. I number the fields on

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Soil Problems Will Be Discussed by Delegates of Twenty-five Nations

FINAL arrangements have been completed for the largest and most important gathering of soil scientists of the world at the International Congress of Soil Science to be held in Washington, June 13-22. The United States has opened the doors of her hospitality and stands ready to entertain her distinguished visitors, many of whom have already arrived.

Twenty-five nations will take part in the Soil Congress. Their official delegates, together with the large number of soil men from the respective state agricultural experiment stations and colleges, will bring the attendance well over 1,000. It is estimated that the foreign delegates will total 100. The following countries have signified their intention of being represented in number as follows: Africa, 3; Belgium, 1; Czechoslovakia, 3; Esthonia, 2; Finland, 2; Germany, 12; Great Britain, 9; France, 2; Holland, 2; Hungary, 3; Denmark, 4; India, 3; Italy, 4; Japan, 4; Palestine, 2; Poland, 7; Norway-Sweden, 6; Russia, 18; Roumania, 2; South America, 5; Switzerland, 3.

The first delegations to arrive in the United States were the Swiss and Dutch scientists who came on the SS. *Vollendam* of the Holland-American Line, June 3. The New York headquarters of the foreign delegation is the Waldorf-Astoria Hotel of New York City. Dr. E. V. Wilcox of the *Country Gentleman* is in charge of arrangements for the reception of delegates on arrival in New York.

President Coolidge will address the Congress in the afternoon of the first day in Washington, and in the evening of the second day, Secretary of State F. B. Kellogg and Secretary of Agriculture W. M. Jardine will give a reception to the delegates in the Pan-American Union at which a large part of the diplomatic corps will be present.

The meetings throughout the 10-day session of the Congress will deal with every phase of soil studies. The chemistry, the structure, the bacterial life of soils are to pass in review. Fertility, methods of cultivation and their relation to crop yields are to be brought into the spotlight. No feature of the earth's soil will escape the scrutiny of these soil delvers. They purpose to pry into the innermost secrets of soil behavior.

There will be reports of investigations on an almost endless vari-

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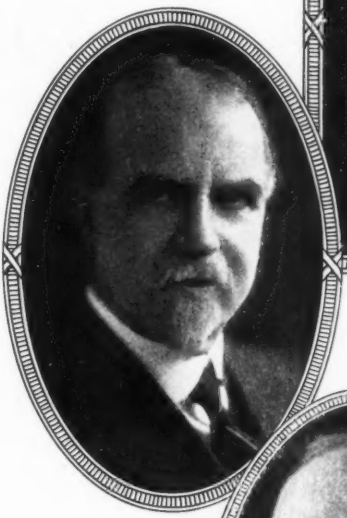
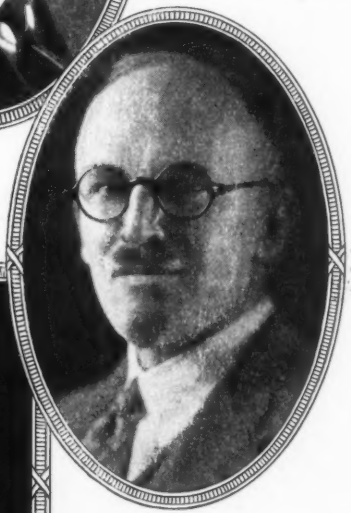
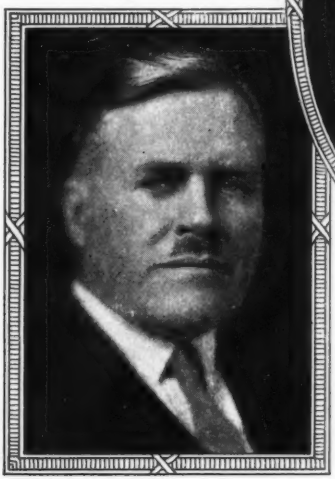
These four men, together with Dr. J. G. Lipman, whose picture appeared in our art gallery last month, are the executives of the American Organizing Committee, International Congress of Soil Science.



Above—Curtis F. Marbut, Ph.D., Chief of the Soil Survey Division, U. S. D. A.



Above — Oswald Schreiner, Ph.D., in charge Soil Fertility, U. S. D. A., is chairman of the committee.



Above—Karl F. Kellerman, B.S., D.Sc., Assoc. Chief, Bureau of Plant Industry, U. S. D. A.

Left—A. G. McCall, Ph.D., in charge of Soils, Maryland College of Agriculture, is executive secretary of the committee.

Members of the American Dairy Federation pay a visit to the U. S. D. A. dairy farm at Beltsville, Md.

This Ohio farmer, in fighting the corn borer, uses a drag with side knives to cut the stalks at the surface of the ground.

Better crops in the Arctics—this rhubarb was grown in a garden at Skagway, Alaska.

This does not happen to be one of Georgia's famous peaches. She is May McAvoy, charming motion picture star, picking some fruit in her own orchard in California. Miss McAvoy has a real interest in better crops.

Too old to mother a brood, Betty has taken up with Duke, the family dog. The hen's age, 18 years, is authentic as she was hatched the same year that a daughter came into the family of Mrs. Sophia Fry of Cincinnati, O.

A beauty spot in the Santa Monica mountains, California, where the "Paradise of Nature," a botanical garden covering 3,200 acres, is being developed for world wide study of plant life.

Schoo

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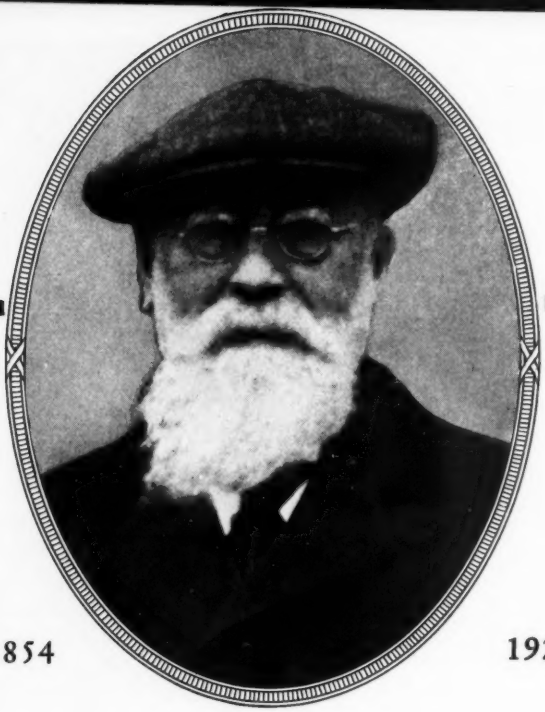


1854 1927

THE death of Dr. Maximilian Kempner, which occurred on May 11 in Amsterdam, means an irreparable loss to the potash industry with which he was connected for more than a score of years.

Dr. Kempner was associated with a great number of industrial enterprises of the first magnitude in Germany and elsewhere and was Chairman of the Board of Directors of the German Potash Syndicate since 1911. Although 73 years of age, in the spring of this year, he undertook a trip to America in connection with the reorganization of the distribution of potash in this country. His stay in the United States brought him into close contact with a number of the leading men in politics and business. All those who had occasion to meet this unique personality were impressed with the rare combination of legal knowledge and indefatigable zeal with personal charm which characterized this veteran in the field of potash industry.

Those who had the privilege of knowing this remarkable man intimately, will cherish his memory as an inspiration towards the highest ideals of unselfish devotion to creative work.

The Editors Talk

"Since we cannot be universal and know all that is to be known of everything, we ought to know a little about everything, for it is far better to know something about everything than to know all about one thing. This universality is the best. . . . . And the world feels this and does so, for the world is often a good judge."

—PASCAL

INTERNATIONAL CONGRESS OF SOIL SCIENCE

THE First International Congress of Soil Science is to be held in Washington, D. C., from June 13 to 22. Papers have been submitted by about 300 delegates from all over the world, all of whom are active soil workers in their respective countries. What, in the future, will be the effect of these meetings on soil science research and its application to practical agriculture?

Soil science as a separate subject, standing on its own feet, is a modern development. It is another instance of splitting up the broad inclusive subject, agriculture. This splitting up process is following the trend of the last two decades. The development of the microscope, for instance, has caused subdivisions of the older subject, geology. Chemistry, too, has been split up into many subdivisions. The study of the soil was at one time a part of the chemist's job. It has now grown to full stature as a subject in itself and big enough to be again divided into smaller subjects. So we have gone on dividing and again dividing agriculture into more and more subjects, each with its own specialist, talking his own tongue.

Because of this, the International Congress of Soil Science offers great opportunities. Accomplishment undoubtedly will be particularly sure in the field of classification, in agreements on technique, and in a clearer knowledge of the world's resources, as represented by soils and soil fertility. Much credit is due the organizing committee who have realized the vision of a few far-seeing men in bringing together soil workers from all parts of the world.

But no one knows better than these men that great problems still remain, not the least of which is the problem of fusing together the high lights of the many subjects into which agriculture has been separated. In other words, we need to realize that opposite to analysis, which is easy, is synthesis which is difficult; that opposite to the theory of the independence of separate scientific groups is the fact of the dependence of one group on another; that while there can be competition between groups, eventually there must be cooperation.

For technical reasons, agriculture must be split into a large number of subjects and working groups; but for social reasons, the findings of these groups must be fused together as a harmonious and working whole that will make possible a fair wage to the men on the land and assure the world's food supply at a price that the world can afford.

The great possibility of the International Congress of Soil Congress is that it has the power to contribute materially towards a practical working policy for the solution of the agricultural problem as a whole for the world as a whole.

"There is a definite relation between the fertility of the soil and the fertility of the human mind. People that live on exhausted, infertile soil are not mentally up to the standard of people that live on soil whose fertility is maintained."

—SECRETARY OF INTERIOR HUBERT WORK

NATIONAL FERTILIZER ASSOCIATION CONVENTION

OUTSTANDING as a feature of the National Fertilizer Convention this year is the national and international character of the speakers. Much credit is due the executive committee of the National Fertilizer Association and Charles J. Brand, the executive secretary, for the care and trouble they have taken in arranging the program and in securing the attendance of such an outstanding body of men to address the convention. Each speaker was asked to come for a definite reason. Each will have something to say that will help every member of the Association. The subjects to be discussed are practical and varied.

The maintenance of crop yields by means of chemical fertilizers during 85 years of continuous experiments will be discussed by Sir John Russell, director of the Agricultural Experiment Station, Rothamsted, England. Sir John brings a very happy combination of scientific and practical experience in crop production.

Spencer L. Carter, president of the association, will, as usual, deliver the presidential address. In the field of merchandising, Charles Coolidge Parlin, director of research for the Curtis Publishing Co., Philadelphia, will discuss several problems. New competition between industries and the special purpose of trade associations, will be discussed by Merle Thorpe, the energetic editor of *Nation's Business*. The association has been fortunate also in obtaining as a speaker Virgil Jordan, economist of the National Industrial Conference Board, New York, who will discuss the agricultural problems of the United States. E. St. Elmo

Lewis, of Detroit, a man with broad executive experience will talk on selling, markets, and profits.

Besides the speakers, there will be plenty of opportunity for golfing, hiking, swimming, and riding.

Of special importance also are several visitors, among them, Prof. Dr. Oskar Eckstein of Basle, Head of the Research Department of the German Potash Syndicate, Berlin.

Every member of the National Fertilizer Association should be at the convention. Every member should hear what these speakers have to say, for only by getting away from our daily job to hear what others are saying and doing can we put that job in the front rank of progress.

Then the village doctor made answer,
"Can I find spirits so soon after all the scenes I have witnessed.
Oh the manifold miseries! Who shall be able to tell them?"
—GOETHE, *Hermann and Dorothea*

THE MISSISSIPPI FLOOD

THE people of the Mississippi valley have suffered as few can realize who have not had intimate contacts with the devastation of angry waters. Such moments of national calamity bring untold sadness but happily such calamities have a brighter side inasmuch as they bring together the whole people of the nation as one great family in the highest form of service—unselfish work for humanity. They bring out the great human qualities of devotion, courage, and fortitude among the stricken, and the helpful as nothing in our modern civilization can do.

While great credit is due the Government officials, the Red Cross, and the people of the nation for what they have done, greater credit is due the people themselves of the flood area for their resourcefulness, their calm courage in the face of danger, and their determination to return and start life anew, undaunted and unafraid in wrestling from nature their living and their future happiness.

"Then I began to think, that it is very true which is commonly said, that the one-half of the world knoweth not how the other half liveth."
—RABELAIS

EVERY one of us has somewhere in the world two and one-half acres producing for him, otherwise he would be dead. It is true that we may live in cities and not know exactly what an acre

is, but for each of us, two and one-half acres are working as surely as though our names and addresses were marked on them.

WORLD'S CENSUS

It has been calculated that on the average each person needs the produce of about this area to live one year. But the land area cannot be increased, whereas human life is increasing at a rapid rate. As time goes on, therefore, there must be more competition for acres, and while there is not at present any need for supposing that the world's population will ever starve, it is vitally important for economic reasons to know the agricultural resources of the land area of the world.

For this reason, the first agricultural census of the world will be taken in 1930. This "unique departure" has been decided upon by the International Institute of Agriculture at Rome, which is "supported by some threescore governments, including the United States."

Who is to direct the work of such an important undertaking? Several hundred candidates were considered. Finally, Mr. L. M. Estabrook, well known as chairman of the United States Crop Reporting Board, was chosen—a very fitting recognition of both the work of the Board and of Mr. Estabrook in particular.

One thing is of outstanding importance, that is, the urgent necessity for such a census at regular intervals. Almost everything in the world, except the art of agriculture, could be wiped out, even if man had to return to it with nothing but his bare hands. Therefore, all agencies that help in the most efficient use of the arable land of the world are vital contributions to the ultimate happiness of everybody, whether they live in the city or on the land.

The world's agricultural census is one of these important contributions. It, therefore, deserves our complete and hearty support. We congratulate the Institute on the inception of the idea and wish Mr. Estabrook every success in its accomplishment.

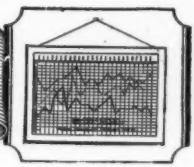
"The reason some men accomplish more is that they attempt more."—Anonymous

FOREWORD

THE editors wish to call the attention of our readers to the announcement appearing on the inside of the front cover.

We believe that combining BETTER CROPS with PLANT FOOD gives us the opportunity to render a better service to the advisory groups in our national agriculture. We shall constantly strive to make the magazine of more value to its readers, and, as in the past, at all times we shall be glad to receive your suggestions and contributions.

AGRICULTURAL DEVELOPMENTS



By P. M. FARMER

Fewer Farmers

As we learn more about farming, and as improved machinery is developed, new methods adopted, and livestock and crops are improved, fewer farmers are needed to supply the raw materials derived from the soil. That this is true is shown by the fact that farm population continues to decrease while we still have the surplus problem with us. Recent estimates by the U. S. Department of Agriculture show that the farm population suffered a net decrease of 649,000 last year. The decrease was from 28,541,000 to 27,892,000. In 1925 the farm population was 28,982,000. All sections of the country showed net decreases the past year. The estimates show that 2,155,000 persons moved from farms to cities in 1926, that 1,135,000 moved to farms, that births on farms were 658,000 and deaths 287,000, all of which leaves a net loss to the country districts of 649,000.

More Farm Radios

That the farmer radio bug is making as good use of the air as the "bugs" on the roots of clover and alfalfa make of it is shown by new radio figures put out by the Department of Agriculture. The most recent survey shows that 1,252,126 farms in the U. S. have receiving sets. These figures, collected through the county agents, show an increase of 126 per cent over the 553,008 sets estimated for July, 1925. Iowa is in the lead with 99,990 sets, Indiana is second with 81,104, and is followed in order by Missouri with 77,510, Nebraska with 69,784, Illinois with 65,832, Ohio with 63,448, and Kansas with 62,055. In this period of less than two years Utah increased its number of farm sets from 899 to 6,061.

California Grapes May Be Grown in East

That California grapes, known to professional horticulturists as the European grapes, may be grown successfully in the East is a statement made recently by the horticulturist at the New York State Agricultural Experiment Station at Geneva. He says that Malagas, Tokays, and Hamburgs, fruit stand favorites, may be grown by the amateur or by fruit producers who have in mind the roadside trade or the local markets. He says that the principal thing needed is certain modifications of vineyard management to protect against winter injury. At the Geneva Station many of these so-called California varieties have been grown since 1911, grafted on roots of native varieties, and have been fruiting each year. No claim is made that these grapes will be grown commercially in the East, but it is said they can be grown in a small way.

Preparedness Against Corn Borer

The corn borer has given the Middle West the biggest scare it has ever had but it is not too scared to think. Illinois, which to date has found a total of one corn

borer within its borders, is making plans to protect its principal crop. The College of Agriculture has set out to find means of growing corn at a profit even if the borer arrives in force. Agronomist and engineers are on the job. They are looking for new strains and varieties especially adapted to corn borer conditions, cultural practices adapted to the new varieties, and methods of handling and cleaning up corn land for the efficient control of the insect. All the existing machines for corn borer control have been collected and will be studied. Agronomists are looking for varieties of corn that can be planted late and yet mature a good crop, and varieties least susceptible to borer injury.

Duckfoot Cultivator Popular in Montana

The idea of plowless summer fallow originated in Montana in 1922. Instead of plowing the ground that was to lie fallow through the summer the duckfoot cultivator was used. That this plan is working well is shown by the statement of R. E. Clarkson, county agent, Teton county, who says that at least 90 per cent of the farmers in one of the big spring wheat producing sections will do at least part of their summer fallowing with this cultivator in place of the plow. The practice of these farmers is to disk the soil early in the spring and, as soon as the weeds start, to go over it with the duckfoot with the shovels set 3 to 4 inches deep. This machine keeps the ground free of weeds throughout the season.

Simpler Milk Bottle

The milk bottle is soon to be a product of less variety in height, capacity, and contour. The Joint Standards Committee on Simplification of Milk and Cream Bottles recently met in New York and considered recommendations of the U. S. Department of Commerce on simplifying these containers. It was recommended the quarter pint size be eliminated and definite sizes, capacities, and dimensions of the quart, pint, and half pint bottles were recommended. One size of cap was considered sufficient for all requirements.

Subsoil Bad for Lawns

Subsoil excavated when house foundations are dug and used in grading up around the house is responsible for many poor lawns says A. Hansen, Purdue University, who conducted a lawn weed survey of Evansville, Indiana. This was one of the important conclusions. Many lawns were found deficient in plant food and usually the cause was subsoil that had been put on top. It was recommended that agreements be made with contractors to save the top soil for lawn growing purposes. It was also recommended that plant food be added to poor lawns, spading in a complete fertilizer rich in nitrogen at the rate of 5 pounds per 100 square feet.

Powdered Buttermilk in Ice Cream

Sweet buttermilk powder made by the spray process and 99 per cent soluble can be used satisfactorily in the manufacture of ice cream according to experiments at the Minnesota Agricultural Experiment Station. The ice cream made with this product has a golden yellow color because of the added color used in buttermaking during the late fall and winter. The color will be lighter in the spring and summer months. One creamery in Minnesota has been making this buttermilk powder and has a capacity of 6,000 pounds a day.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

Adventuring for Agriculture

By WILLIAM J. MADDOX

U. S. Department of Agriculture

ALL the romance of adventure and the thrill of discovery are blended in the work of the plant explorers who are searching the earth for new plants to enrich American farms and gardens. Braving innumerable dangers and hardships, these intrepid botanists, often traveling alone, push their way into jungle fastnesses and through mountain wilds never before trod by white man.

Sometimes it is into notorious tiger or wild elephant country. Sometimes it is into the bandit infested hills of interior China, or into the sacred Buddhist lands of Tibet. At other times the plant desired is to be found only in some pestilential jungle of the Tropics.

The farthermost reaches of the railway or the steamboat is but the beginning of the plant explorer's journey. He turns his back completely on civilization and strikes out into the wild country. If native help is to be had for such an undertaking he engages a cook and probably one or two coolies. Maybe they go on the whole trip. If not he is obliged to get others at some interior native village. There is always the possibility of being left to make the worst of the trip alone.

An American plant explorer in the wilds of China

Africa, with its great variety of plants, is one of the happiest hunting grounds of the explorer. It has been the scene of a number of notable expeditions. The most extensive probably is the 9,000-mile journey made in 1919 by Dr. H. L. Shantz for the Government.

The chief purpose of his trip was to study the native agriculture with an eye out for new fruits, nuts, forage crops—especially those adapted to our South and West—new sorghums, particularly wild sorghum grasses of types similar to Sudan grass, which has proved such an important forage crop in the semi-arid regions of the West.

Leaving Cape Town, Dr. Shantz struck out into the very heart of the Dark Continent. At places he was 1,000 miles inland, frequently as much as 800 miles from a railway. Occasional detours to the coast were made for visits to Zanzibar and other islands. More than a year later he came out at the headwaters of the Nile. The expedition officially ended at Port Sudan, more than 9,000 miles having been traversed.

In many places the route of Dr. Shantz took him over wilderness ways traveled by Livingstone.

ASIA, too, has proved a fertile field of exploration. Some of the most successful finds in that part of the world were made by Frank N. Meyer. He spent many years in China and lost his life a few years ago in the line of duty.

For a quarter of a century the work has been carried on systematically by the Government. But even before that a number of interesting and useful plants were introduced into this country from foreign lands. They came chiefly from missionaries and naval officers interested in botany.

Altogether some 80,000 plants have been tried out in the experimental grounds and houses of the Department of Agriculture. They have come from almost every place mentioned in the geographies and from many that most of us never heard of.

A great many of these, of course, sooner or later are given up as worthless for one reason or another. But those which have made good here are now enriching the country's agriculture and horticulture to the extent of many millions of dollars each year.

TODAY new plants and seeds from explorers and voluntary contributors are coming into the department at the rate of about 10 packages a day.

The catalogs describing the plants and their histories read like a romance of botany in serial form. One paragraph may take you to Mexico where some traveler has discovered a plant, related to one of our common weeds, whose seeds once filled the granaries of the Aztecs. In the next the scene shifts to Africa, the source of a number of crops now important to American agriculture, or to China, a veritable wonder garden of fruits and nuts, vegetables, and flowers. Then we are told of one of the queer plants of New Zealand or Australia that may have possibilities as a provider of wood, food, shade, or beauty.

In some of the more recent catalogs are described blight-resistant pears from China. These may some day save our orchards from being wiped out by disease. Some may be used as stock on which to graft more luscious varieties. From the same country have come chestnuts resistant to the bark disease now rapidly killing off our native trees; the yang-tao, a fruit said to combine the flavors of the gooseberry, straw-

Plant explorers seek high and low for new varieties.

berry, pineapple, guava, and rhubarb; the jujube, an odd fruit now being grown in California.

IN the same list is the neem tree from India with wood like mahogany, fruits that yield a medicinal oil, and sap that may be made into a cooling drink; the giant lilies from the Himalayas; the mitsuba, a common vegetable from Japan that resembles some of our native plants found growing all the way from Nova Scotia to Texas; high-yielding wheats from England and Australia; from Colombia a night-blooming cereus with blood-red flowers like saucers; the New Zealand corkwood tree with wood only half the weight of ordinary cork; a brilliant gourd from the Philippines which possibly may be grown in the South and marketed as a Christmas tree ornament and whose leaves provide delicious greens; a wild rice from West Africa that may be used for marsh pasture; a citrus fruit from India with a concentrated peach flavor; a Japanese sumac which colors brilliantly in the autumn; a mountain cherry with rose-red blooms; Australian elephant grass which yields 30 tons of hay to the acre; and from the same continent an edible canna, a single plant of which in Florida has produced 80 pounds of tubers.

Most interesting of the introductions from nearer home is the huauhtli of Mexico, an amaranth resembling pigweed. It was cultivated by the Aztecs before Columbus discovered America. Accounts show that every year 18 granaries, each with a capacity of 9,000 bushels, were filled by Montezuma. The Aztecs exacted tribute in this grain from conquered peoples. Later the Spaniards found the grain could be made into a very tasty flour for cakes.

THE success of some of the introduced plants has been little short of spectacular. Crops introduced not many years ago in a

few small packages that could have been loaded into a boy's little red wagon have increased to such an extent that they now bring in round figures some $100,000,000 annually.

One of the first successful introductions, durum wheat, now yields an annual crop of 40,000,000 bushels worth approximately $50,000,000. For 35 years durum wheat had been imported in a hit-or-miss fashion and had been given up as unsuited for our climate. The Department of Agriculture took a hand in the problem, and durum wheat now is established very successfully in the Great Plains region.

The need for a long-staple cotton led the Department to investigate the famous Nile-fed fields of the fellaheen. As a result the Pima cotton of Arizona was developed. This crop has been a big boon to the automobile tire industry, and has given the Salt River Valley a profitable agriculture.

The date-growing industry has been in existence in other lands since the dawn of time. It was practically unknown in this country in 1898. Today there is a flourishing date industry in the Southwest.

In 1909, the Department introduced from Africa a grass that has become known as Sudan grass. It soon became popular as a forage crop in the semi-arid regions and since has spread over a much wider territory. In 1918, nine years after the arrival of the first small bag of seed, there were half a million acres of this crop growing.

The cultivation of new plants has given us a more varied food supply for ourselves and for our domestic animals. They have also enabled us to use large areas that before were waste land. And we are adding beauty in other places as well.

* * *

The difference between a cow chewing her cud and a flapper chewing her gum is that a cow always looks as if she were thinking.

Dr. Shantz in his temporary camp on the Kafue River, Northern Rhodesia

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

Probably one of the greatest needs in the field of soil fertility research today is that of more comprehensive data on the relation of the use of potash to economical production of farm crops. So numerous are the factors which influence the response of a crop to potash fertilizer that few agricultural experiment stations have found it possible to give them any great amount of study.

Among the agricultural experiment stations which have emphasized the economic importance of potash in crop production, the station at Amherst, Mass., stands out for its completeness of work, length of period these studies have been carried on, and conclusions.

In Bul. 232, Director Sidney B. Haskell summarizes the results of some 30 years of experimental work instituted by former Director Wm. P. Brooks and the late Dr. C. A. Goessmann. The primary objects of this work were to determine the response of different crops to the use of potash fertilizer and a comparison of different potash carriers, particularly a comparison of muriate and sulfate of potash

Results of these long standing field experiments demonstrate conclusively that potash is an important factor in crop production. Significant among the results are that crops vary considerably to potash applications; when used on sandy loam soils in the absence of animal manure, potash has a decided influence on crop yields; and that the differences between effects of muriate and sulfate although important with certain crops are relatively minor and difficult of measurement. Sulfate lessens the tendency of winter killing in cane fruits. It improves the stand of clover and the quality of table potatoes more than does muriate.

Another fertilizer bulletin which deals more or less with potash experiments is the new one just issued by the Wisconsin Agricultural Experiment Station, Bul. 392, "Fertilizers and Crops for Marsh Soil." In emphasizing the need for potash the authors of this bulletin state that potash fertilization is as important as planting seed on Wisconsin marshes. A dairy herd cannot remedy a soil deficiency of potash and keep the farmer solvent. The bulletin also treats with clear understanding, other problems of soils management.

"Commercial Fertilizers Agricultural Minerals," State of California D. of A., 1926, Special Pub. 69, Warren G. Marshall.

"Fertilizer Grades and Formulas," Ext. Ser., Durham, N. H., Ext. Cir. 67, Mch., 1927, F. W. Taylor.

Soils

"Cropping Systems and Soil Efficiency," Conn. Agr. Col., Storrs, Conn., Ext. Bul. 103, Feb. 1927, M. F. Morgan.

Crops

Among the crop bulletins, Iowa's No. 241, "Crop Returns Under

Various Rotations in the Wisconsin Drift Soil Area," by W. H. Stevenson, P. E. Brown, and L. W. Forman, carries a lot of practical information for the farmer. These gentlemen conclude from their investigations that probably the longer rotation of four or five years may be of more value over a period of time than the shorter three-year rotation. The latter is definitely preferable to the two-year or continuous cropping system. The bulletin also shows the value of fertilizer to soils in this area under the various rotations.

Massachusetts has recently revised its extension leaflet on the "Home Garden." The new number is 59, and a great many helpful suggestions to any one interested in the small garden are contained in its 16 pages.

Tennessee has issued a very compact and meaty little circular No. 11 on the "Rates and Dates of Planting for Tennessee Farm and Garden Crops." It should find a place on every farmer's and county agent's book-shelf throughout this and surrounding commonwealths.

Other bulletins on crops include:

"Suggestions on Grapefruit Culture in Imperial Valley," Agr. Ext. Ser., Berkeley, Cal., Cir. 7, Dec. 1926, Raymond Ellis.

"Culture of the Oriental Persimmon in California," Agr. Exp. Sta., Berkeley, Cal., Bul. 416, Jan. 1927, Knowles Ryerson.

"Report of the Agricultural Experiment Station, University of California, From July 1, 1925 to June 30, 1926," Berkeley, Cal.

"Effects of Clover and Alfalfa in Rotation," Colo. Exp. Sta., Fort Collins, Colo., Bul. 319, Mch. 1927, Wm. P. Headden.

"Biennial Report 1925-1926," Conn. Agr. Col., Storrs, Conn., Ext. Bul. 106, Mch. 1927, B. W. Ellis.

"Grafting Fruit Trees," Conn. Agr. Col., Storrs, Conn., Bul. 107, Mch. 1927, W. H. Darrow.

"Double Crossed Burr-Leaming Seed Corn," Conn. Agr. Col., Storrs, Conn., Ext. Bul. 108, Mch. 1927, D. F. Jones.

"The Quality of Vegetable Seed Sold in Packets in Connecticut," Conn. Agr. Exp. Sta., New Haven, Conn., Bul. 283, Jan. 1927, E. M. Stoddard and A. D. McDonnell.

"Inoculation of Legumes," Agr. Exp. Sta., Ames, Iowa, Cir. 102, Mch. 1927, P. E. Brown and L. W. Erdman.

"Prevention of Wind Injury to Crops on Muck Land," Agr. Exp. Sta., East Lansing, Mich., Cir. Bul. 103, Mch. 1927, Paul M. Harmer.

"Why a Cull Apple is a Cull," Agr. Exp. Sta., East Lansing, Mich., Spec. Bul. 160, Feb. 1927, H. P. Gaston.

"Vegetable Gardening in New Hampshire," Univ. Ext. Ser., Durham, N. H., Ext. Bul. 25, Revised, Feb. 1927, J. R. Hepler.

"Progress of Agricultural Experiments —1926," Agr. Exp. Sta., Durham, N. H., Bul. 227, Feb. 1927, J. C. Kendall.

"Forty-ninth Annual Report of the N. C. Agricultural Experiment Station," Raleigh, N. C., R. Y. Winters.

"The Bimonthly Bulletin," Agr. Exp. Sta., Wooster, Ohio, Vol. XII, No. 2, Whole No. 125, Mch.-Apr. 1927.

"The Cranberry in Oregon," Agr. Exp. Sta., Corvallis, Ore., Sta. Bul. 225, Jan. 1927, W. S. Brown.

"Influence of Cowpea Crop on Yield of Corn," Agr. Exp. Sta., Knoxville, Tenn., Bul. 137, Mch. 1927, C. A. Mooers.

"Thirty-Ninth Annual Report, 1926," Agr. Exp. Sta., College Station, Tex., A. B. Conner.

"The Relation Between Crop Yields and Precipitation in the Great Plains Area," Misc. Cir. 81, U. S. D. A., Washington, D. C., Feb. 1927, E. C. Chilcott.

"Tomato Culture in Utah," Agr. Exp. Sta., Logan, Utah, Cir. 63, Mch. 1927, A. L. Wilson.

"Onion Growing in Utah," Agr. Exp. Sta., Logan, Utah, Cir. 64, Mch. 1927, A. L. Wilson.

Department of Agriculture and Immigration of Virginia, Richmond, Va., Bul. 232, Apr. 1927.

Department of Agriculture and Immigration of Virginia, Richmond, Va., Bul. 233, May, 1927.

"Outdoor Flowers for the Home," Col. of Agr., Madison, Wis., Cir. 212, Mch. 1927, James G. Moore.

"The Chemical Composition of Plants in Relation to Photo-Periodic Changes," Agr. Exp. Sta., Madison, Wis., Research Bul. 74, Feb. 1927, G. T. Nightingale.

American Potato Journal, Washington, D. C., Vol. IV, No. 4, Apr. 1927, B. E. Brown.

Economics

Judging from the number of economic bulletins which have come to the editor's desk this month, more and more attention is being given to this phase of the farming industry. Nine different States, as well as the U. S. D. A., have issued bulletins and circulars on economic questions Of more general interest is Wisconsin's bulletin 393, "Tax Burdens Compared, Farm-City-Village," by B. H. Hib-

bard and B. W. Allin. That the burden of farm taxes has not only increased relatively more than that of city and village taxes since the war, but since the pre-war period the farm group has also been more seriously burdened by the increased requirements of government than has either of the other two groups, is an important fact brought out in this publication

"Farm Economics," Auburn, Ala., Vol. II, No. 9, May 2, 1927, F. W. Gist.

"Economic Aspects of the Cantaloupe Industry," Agr. Exp. Sta., Berkeley, Cal., Bul. 419, Feb. 1927, E. Rauchenstein.

"Factors that Influence Profits on Irrigated Farms," Exp. Sta., Fort Collins, Colo., Bul. 318, Mch. 1927, L. A. Moorhouse, R. T. Burdick, and J. B. Hutson.

"Preliminary Report on Labor and Materials Required for Some Florida Crops," Col. of Agr., Gainesville, Fla., Vol. XXII, No. 2, Apr. 1927, J. E. Turlington and Frank W. Brumley.

"An Economic Study of Truck Farming in the Plant City Area," Col. of Agr., Gainesville, Fla., Vol. XXI, No. 3, Oct. 1926, Bruce McKinley and W. C. Funk.

Illinois Crop Report for April 1, 1927, U. S. D. A. and Ill. Dept. of Agr., Washington, D. C., Cir. 363, A. J. Surratt.

"Farm Economics," Col. of Agr., Cornell Univ., Ithaca, N. Y., No. 44, Apr. 1927.

"Farmers' Elevators in North Dakota," Agr. Exp. Sta., Fargo, N. D., Bul. 206, Feb. 1927, Alva H. Benson and M. F. Peightal.

"Short-Term Farm Credit in Texas," Agr. Exp. Sta., College Station, Texas, Bul. 351, Mch., 1927, V. P. Lee.

"Crop Report Regulations, 1927," Misc. Cir. 96, U. S. D. A., Washington, D. C., Feb. 1927 Revised Mch. 1927.

"Speculative Transactions in the 1926 May Wheat Future," Dept. Bul. 1479, U. S. D. A., Washington, D. C., Mch. 1927, J. W. T. Duvel and G. Wright Hoffman.

"The Farm Lease in Wisconsin," Agr. Exp. Sta., Madison, Wis., Bul. 391, Feb. 1927, B. H. Hibbard and Harold Howe.

Diseases

"Investigations on the Sugar Cane Disease Situation in 1925 and 1926," Agr. Exp. Sta., Baton Rouge, La., La. Bul. 197, Apr. 1927, C. W. Edgerton and E. C. Tims.

"The Timing of Apple Scab Sprays," Agr. Exp. Sta., Wooster, Ohio, Bul. 403, Mch. 1927, H. C. Young and Curtis May.

"A Progress Report on the Removal of Spray Residue from Apples and Pears," Agr. Exp. Sta., Corvallis, Ore., Sta. Bul. 226, Feb. 1927, R. H. Robinson and Henry Hartman.

Insects

Two states have just brought off the press information on the European Corn Borer—Michigan, Ext. Bul. 55 deals with "Plowing for European Corn Borer Control," while New Hampshire gives a life's history of the "European Corn Borer," in Tech. Bul. 33.

Other insect bulletins of the month include:

"Twenty-sixth Report of the State Entomologist of Connecticut, 1926," Agr. Exp. Sta., New Haven, Conn., Bul. 285, Feb. 1927, W. E. Britton.

"The Control of Armyworms and Cutworms," Agr. Exp. Sta., Ames, Iowa., Cir. 101, Mch. 1927, Carl J. Drake and H.M. Harris.

"Some Caterpillars Frequently Mistaken for the European Corn Borer," Agr. Exp. Sta., Ames, Iowa, Cir. 103, Apr. 1927, C. J. Drake and G. C. Decker.

"Sugarcane Borer Control Aided Through Utilization of Infested and Trap Corn," Agr. Exp. Sta., Baton Rouge, La., La. Bul. 198, Apr. 1927, W. E. Hinds and Herbert Spencer.

"The Codling Moth in Massachusetts," Agr. Exp. Sta., Amherst, Mass., Bul. 233, Mch. 1927, A. I. Bourne and W. D. Whitcomb.

"The Poisoning of Honey Bees by Orchard Sprays," Agr. Exp. Sta., Amherst, Mass. Bul. 234, Mch., 1927, A. I. Bourne.

"The Cotton Flea Hopper," Agr. Exp. Sta., Clemson College, S. C., Bul. 235, Mch., 1927, C. O. Eddy.

"The Mexican Bean Beetle," Agr. Exp. Sta., Clemson College, S. C., Bul. 236, Mch. 1927, C. O. Eddy and L. C. McAlister, Jr.

"Spray Programs for Fruit Trees," Agr. Ext. Ser., Knoxville, Tenn., Pub. 113 (Revised) Feb. 1927, W. C. Pelton.

* * *

The Crimson Carpet of Tangipahoa

(*From page* 18)

and 200 pounds of sulphate of potash. It says that the nitrate fertilizer should be divided, 400 pounds applied in the mixture and 100 pounds used as a side dressing.

After planting, the crop is care-

fully watched and tended. Weeds are kept down until it is mulched with pine straw at the rate of about two wagon-loads to the acre. Mulching makes the land hold moisture, keeps the weeds down and the berries clean by keeping them out of the dirt.

When the winter is mild and there is no late frost, there is a possibility of getting two crops of berries—the leaf crop, which is formed near the leaf as individual berries, and the bud crop, which is formed in clusters around the bud. The growers were fortunate in getting both crops this season due to good weather conditions. It has been estimated that the average cost of producing a crate of berries is $1.25 and they bring an average price of $3.45. The price was around $4.00 the first part of this season.

Although the five-year average yield for the section has been something like 65 crates per acre, some of the best growers get 300 crates per acre, and a net profit of $1,000 per acre is not surprising. The usual size of the strawberry farms is about 10 acres. One man can tend three acres with help at the harvest.

The peak of the season is reached in late April and early May. During the peak last year 109 cars were rolled out of Hammond in one day. The first week in May each year, Hammond revels in a strawberry festival which is comparable in splendor and gaiety to the orange, peach, apple, and rose festivals of other states.

* * *

The World's Pantry

(*From Page 9*)

most active in founding it were David Lubin of California and King Victor Emmanuel III. of Italy.

It is related that early in the present century David Lubin, a successful business man of the Coast, started out to find who fixed the price of wheat. He visited in turn the grain exchanges of the Pacific Coast, Kansas City, St. Louis, Minneapolis, Duluth, Chicago, and New York. At the last he was told that the wheat quotations in the markets of this country were the Liverpool prices less the cost of transportation to Liverpool.

Accordingly, he went to the great English market. There he found that the price of wheat was the result of free competition between buyers and sellers on the floor of the grain exchange, and that relatively few men were engaged in the actual trading; that buyers and sellers based their prices upon relative supply and demand throughout the world; that in order to determine the relative supply and demand they made use of official and unofficial sources of information, that is, government reports, private estimates, statistics of imports and exports, and trade rumors, all of which were more or less fragmentary, incomplete, and unsatisfactory.

Lubin conceived the idea that if the distribution and price of the world's greatest bread grain in which humanity is so vitally interested depends upon the relative supply and demand, then the governments of the world should systematically collect and publish dependable data on production, supply, movement, exports, imports, consumption, surpluses, deficits, transportation rates, and prices, and that somewhere in the world there ought to be an international organization to which the government reports might come and where they could be summarized in world balance sheets and reported back to all the countries.

Lubin failed to get the support

of his own government for his scheme of international crop reports. He tried Great Britain, but without success. France was uninterested, too. But in Italy King Victor Emmanuel agreed to take the initiative himself.

He was as good as his word. A convention of delegates from the principal countries met in Rome and on June 7, 1905, signed a draft of a treaty establishing the International Institute of Agriculture. This was subsequently ratified by more than 60 governments which now contribute funds to the Institute's support.

TWO years later the Institute opened its doors ready for work. The beautiful site of the grounds of the Villa Borghese was a gift of the city. Its home, an imposing marble structure was erected by the King as his personal gift. In addition he set aside from his private fortune an endowment that yields the Institute some 300,000 lire annually.

The question is often asked: How does the Institute help the American farmer and why is the United States contributing to its support?

Many of the products of the American farms must be sold in our own markets and in markets abroad in direct competition with the products of the farmers of other countries. It is, therefore, necessary—and becoming more so every day—for the American farmer to judge intelligently how much to produce and when to market his product to the best advantage. To do this he must have forecasts and estimates of how much is being raised by the farmers of other countries—his competitors. He must know how much of the last crop was carried over and is likely to be marketed in competition with the new crop. Furthermore, he must be kept advised as to the world demand for his product.

There is, too, the matter of speculation. Speculation thrives on uncertainty and misinformation.

The Institute has direct contact with practically every civilized country. Through it the United States Department of Agriculture has immediate telegraphic contact with the 26 important producing areas of the world. Information on areas seeded, state of crops, weather conditions affecting the harvest, and the probable production may be obtained from any of these regions and broadcast to American farmers within 24 to 36 hours.

In each of these producing areas the Institute is in contact with the local official estimating agency. For example, British India, a vast agricultural region, is divided into a large number of provinces. Each province is subdivided into districts. There is a seperate crop

These machines sowed 500 acres of grain in 2½ days, breaking all records.

reporting service in each district. Individual reports to the district office are summarized and forwarded to the central office of the province.

Here the district reports are made into a provincial report and sent to the central office for all India. This office immediately telegraphs the data to the Institute at Rome, which, in turn, transmits it to the world. The United States Department of Agriculture really gets the summarized observations of thousands of individual farmers located in all parts of India.

Thus, when the Institute receives its crop condition reports from different countries it at once telegraphs them to the United States Naval radio station at Paris. The Navy radios the summarized report to Washington, where it is delivered to the Department of Agriculture. The Department releases it to the press simultaneously from Washington and from various state offices throughout the country.

At 5 o'clock on the day of arrival in Washington the information is also broadcast by radio from the Department and all farmers having radio receiving sets may listen in. In this way, the reports are given wide distribution to all farm and commercial centers in the United States.

LIKE all new organizations of its kind, the Institute has had to win its spurs. Its work lies in a field of vast importance, yet it is one that does not lend itself to spectacular effects. The technical nature of the matters dealt in does not make a ready appeal to the "man in the street." But slowly and surely it has won recognition, gaining for itself an assured position in the economic councils of the nations.

No other international body can claim to represent so large a proportion of the world's total area—96 per cent, and total population—97 per cent. The economic conference at Genoa in 1923 adopted a resolution inviting all the governments in the interest of agricultural production, to pay special attention to the work of the Institute.

Much has been done, but more remains. What the Institute needs is a just appreciation of its achievements and its possibilities. It is a clearing-house not only of information but of ideas. It affords an international forum where farmers can make their voices heard on phases of international policies affecting their special problems.

Each country maintains a delegate to the permanent committee of the Institute, who resides at Rome. At present the American delegate is Dr. Asher Hobson. In the delegate his government has a potential ambassador of agriculture accredited to an international court. He is the liaison officer, keeping not only his government but the great agricultural associations of his country in touch with world developments that affect their interests.

The Institute is in every way a league of nations, and one that is vital and efficient in what it does and the result it obtains.

* * *

Potash Fertilizers

(*From page* 11)

phate only. The 5-8-7, while the most expensive, was found most profitable. Reducing ammonia to 2 per cent in plot No. 2 follows a close second. The first three plots with 7 and 10 per cent potash

average better than $68 per acre above fertilizer cost.

Reducing the potash, plot 4, also reduces the yield very materially. The need of this element is also shown in the comparison of plots 5 and 6. Plot 3, however, is inconsistent. The fertilizer effects on quality are also very interesting. In general, the high potash plots show lowest percentage of No. 2's. In all these tests muriate of potash was used.

Based upon the one year's work it appears that under the conditions obtaining, the exclusive grower can use profitably 800 to 1,000 pounds of high analysis fertilizer carrying about 5 per cent ammonia, and 7 to 10 per cent of potash, and 8 per cent of phosphate. The second clover crop is needed to furnish organic matter.

In trial No. 2 manure was applied on the entire plot in 1924 and 1925 at the rate of eight loads per acre. Lighter applications of fertilizer were used, likewise drilled in the row.

On 6 of the 7 plots the fertilizer indicated in the table was drilled in the row as indicated in Table No. 2. The residual effects of the manure were undoubtedly of some benefit. Plot 7, the unfertilized one, in 1926 produced 177.4 bushels which was excelled by each of the treatments except on No. 6 where phosphate only was applied. Here a depressing effect was obtained. Unfortunately the fertilizer attachment in use failed to sow the same amounts of fertilizer per acre when drilling mixtures varying in volume, weights, and texture, hence the variations in amounts used per acre.

Under conditions obtaining on farms where manure is available the one year's results indicate that high ammonia fertilizer is not as profitable as in the case where manure is not available. Potash, in general, is needed in fairly ample amounts even when manure (really a potash fertilizer) has been applied the preceding year. The 2-8-10 fertilizer ranks highest with an acre return of $59.84 above fertilizer cost. The data, however, show some inconsistencies as for example in plots Nos. 4 and 5. The fertilizer effect on quality again shows the value of fertilizing the crop.

It will be noted that the yields on the average are higher under the exclusive system than where manure is utilized in the rotation. In part this is due to better cultural treatment by the exclusive grower. Spraying was carried on more systematically and efficiently for one thing, Cobblers were grown by the former while Rurals were grown in the latter case. This may be a factor though the spraying is undoubtedly the most important one. With clover in the rotation 500 to 600 pounds of fertilizer may be used profitably with manure. A mixture containing approximately 2 per cent of ammonia, 8 per cent phosphate, and 7 to 10 per cent potash appears a fairly well balanced fertilizer.

* * *

That Credit Squeeze

(*From page* 16)

Such a defense can in fact be made. Farmers did not put up with the old system because they liked it, and bankers did not require them to do so out of a desire to put their clients at an undue disadvantage. Farmers and bankers alike were governed by necessity. Commercial banking is based on deposits. When depositors want their money, the banker has to be able to call in his loans. Hence he cannot grant agricultural credits for terms corresponding to

the period of the agricultural turnover, unless he has some other source of loanable funds besides deposits. The necessity for keeping loans liquid to protect deposit liabilities obliges him to insist on difficult terms of repayment.

No such necessity hampers the new intermediate credit banks. Their loaning power is not based on deposits. It is based on their capital, supplied from the national treasury, and on investment money obtained by the sale of bonds having a definite maturity. Funds so obtained can safely be loaned for terms corresponding to the maturity of the bonds, and such terms are ample for ordinary agricultural purposes. In this difference between the source of the loaning power of the commercial banks and that of the new intermediate credit institutions lies the explanation of the superior ability of the latter concerns to meet the farmer's credit needs.

THIS innovation in farm finance has alarmed many persons. It is unquestionably a radical departure from past methods. Yet it is manifestly logical. Formerly our farm credit system worked well only when money was easy. Every time money was tight there was trouble.

The most recent instance is fresh in mind. Farmers in the beginning of 1921 had personal and collateral credit from banks to the amount of nearly $3,870,000,000. They had in addition large amounts of personal credit advanced by merchants. This huge credit structure was suddenly undermined by a collapse of commodity prices, and a withdrawal of deposits from the banks. It became necessary for banks to force a liquidation of agricultural loans, with the result that grain and livestock had to be dumped on the markets at sacrifice prices and farmers lost millions. The loan renewals which farmers had relied on to tide them over their production and marketing operations were not forthcoming.

UNDER the new system, by which farmers can get loans for the time necessary to complete their work, credit squeezes like that of 1921 ought to be impossible. Though the intermediate credit banks do not deal directly with the individual farmer, they can get intermediate credit to him through financial institutions or through farmers' credit corporations. There is nothing in the idea that lack of the power to deal with the farmer directly prevents the intermediate credit banks from functioning efficiently. It is safe to say that in any credit emergency the banks will be glad to avail themselves of the rediscount facilities of the new institutions, just as they were glad in 1921 and 1922 to take advantage of the facilities of the War Finance Corporation.

But if the banks, for any reason, should refuse to discount farm paper at the intermediate credit banks, farmers can form credit corporations to do the job themselves. This is provided for in the Federal act. Such corporations need only have a minimum capital of $10,000. State legislation is needed to give them certain financial powers, such as the authority to borrow money and make loans; but many States already have such legislation. Others are preparing to enact it. In some States the intermediate credit banks are helping farmers to organize credit corporations.

Moreover, the intermediate credit banks can make loans directly to farmers' cooperative associations. They are already doing so on a considerable scale. Up

to October 27 they had rediscounted paper to the amount of $1,894,461 for agricultural credit corporations, and had made large direct loans to them on commodities. Loans from the intermediate credit banks promise to be a considerable factor in the development of cooperation in the near future.

It should be understood that the value of the new farm credit system is not to be measured in terms of loans and discounts. Of more importance, perhaps, is the fact that it loosens up commercial credit for the benefit of agriculture, and furnishes a source of credit always available in an emergency. From 1921 to August of this year the War Finance Corporation authorized advances to cooperative associations amounting to more than $190,000,000. Yet it actually loaned to them only $38,500,000. Because the credit was available, the cooperatives found they did not need to draw upon it. There is no question that the existence of the intermediate credit system will have a similar effect.

There is much to be done before the new system effects all the good results of which it is capable. Farmers themselves must take part in this task. In some States, for instance, existing laws do not permit the formation of agricultural credit corporations with power to avail themselves of the rediscount facilities of the intermediate credit banks. It is obviously the business of the farmers to interest themselves in correcting this legal defect. In the main, however, the greatest difficulties in the work of financial reform have been overcome.

It is not too much to say that the new credit system promises to put the farmer on a par with commerce and industry as regards credit facilities. In the past he has not enjoyed this benefit. Our banking system has grown up primarily to serve industry and trade, and its adaptation to the needs of agriculture has been a clumsy makeshift. The agricultural credits act of 1923 tends to give the farmer security in his credit operations, and to place farm finance for the first time on a scientific foundation.

* * *

Ivan Morris, Master Farmer

(*From page* 19)

but some of them are still heated by the original stove method. Ivan uses the old equipment as long as it will make him money. Today he owns 44 acres of land worth $1,000 an acre, and rents 100 acres more. All this is devoted to vegetables.

Two years ago his business on the 144 acres amounted to $82,200 and last year it was about $60,000. Morris says that profit in vegetables is a matter of growing the right vegetables at the right time and of finding the best market. Do I hear some one say, "Of course any one knows that. But what are the right vegetables and how can we produce them at the right time and where is the best market?" Ivan is a firm believer in personal contact in marketing, but at the same time he does not depend upon his home market. He has visited and knows personally each of the commission men to whom he ships. He keeps in touch

with his markets by telephone and telegraph. Each month his telephone and telegraph bills average more than $100 and one month they amounted to almost $200. He said, "I never let a dollar stand in my way when I want to learn about the markets." Ivan says, "Let the markets tell you what to grow and when to grow it."

Every gardener knows that light sandy soils are well suited to vegetables, especially early vegetables. But, sand has its disadvantages, and not the least of them is the cutting power of wind-blown sand. Ivan has learned to accept this philosophically. This spring, he pointed to a 20-acre field and said, "I had as fine prospects there for a spinach crop as I have ever seen. A few days ago we had a strong wind and the sand cut off every plant." He smiled as he told about it and went on to say, "I will put a team in there today with a double shovel plow and will lay that land off for early watermelons."

Another fault of sand is the danger of crops burning out, but in spite of this Morris does not use the sprinkling system. "I know that the Indianapolis and other gardeners irrigate their vegetables, but I have too much land to do this and I can hold the moisture by keeping humus in the soil. I cannot get manure enough, and so I plan my rotations to get legume crops on all my land. I believe that peas and beans are just as beneficial as clover. We harvest the crop and turn under the vines. If possible I plant rye on every field in the fall and turn it under in the spring. We use from 50 to 100 bushels of rye seed each year."

MORRIS works this ground continuously throughout the season, but he also feeds it heavily. On an acre of cabbage he will use 10 tons of manure, 660 pounds of 2-12-6 fertilizer, and will also put a tablespoonful of nitrate of soda in a circle about 5 or 6 inches from each plant. Last year he found that this extra application of nitrate paid royally in heavier yields and earlier cabbage. One of the cardinal points of vegetable gardening is to have good vegetables when the other man is out. This nitrate on the cabbage enabled Ivan to harvest most of his crop before the other Terre Haute gardeners had started.

LET me emphasize another character of the man that is illustrated by this fertilizer incident. Many gardeners would have kept this information under their hats, but Ivan did not. He has given this information and will tell any other discovery he may make. He is for the best interests of his community and of his fellow gardeners. It is this characteristic that has given the Terre Haute gardeners their confidence in Ivan Morris. They know that he is not easily stampeded by any new idea. He is willing to make the trials of new things himself, to stand the loss if there is any, and to give others the benefit of his experiences.

A few years ago the county agent attempted to organize the Terre Haute vegetable growers into an association. The gardeners were apparently willing but he had no marked success. On every side the question was asked, "What does Ivan Morris think of it?" The county agent did not know, but he soon consulted with Morris, sold him the idea, and as a result Terre Haute has a strong market gardeners' association. It has done more to benefit its members than any other similar organization in the State.

Four years ago Morris went

into politics. He was much interested in being elected to a position that pays $1,500 a year and takes considerable time. Seems odd, does it not, that a man making 10 times this amount and who flatly refused a position in Chicago paying $10,000 a year should be so eager for this election? It may seem odd, but it is not when you know Ivan Morris. The election he sought was township school trustee, and when asked why he wanted the job he said, "I have six children. My boy is 12 years old. Four years ago we had a poor school here and I found that my boy was not doing well in school. He was not interested. I was afraid he would become disgusted with school later and would not want to go on through college. We had to have a better school and the only way I could see to get it was as trustee. I want a good school for my children."

How well he succeeded can be seen in the fact that his township now has the name of having the best school in the county. This looks as if Ivan is right when he says any man can succeed if he knows what he wants and works for it.

* * * *

Soil Problems Will Be Discussed

(*From page* 28)

ety of soil topics. What is the maximum production possible by the whole soil blanket of the world? May we depend on drawing fertility only from the upper foot or two of soil, or may plant food be brought to the surface in soil moisture from lower depths? In other words is our supply of fertility a foot or a mile deep? Can we learn the secret process by which certain bacteria seize upon nitrogen from the air? How may alkaline or water-logged soils be best reclaimed? These and hundreds of other topics are on the program.

Many papers have been submitted by soil scientists which will be presented to the Congress. Abstracts are being translated into English, French, and German, and will be given to the delegates in advance, so that they may familiarize themselves with the subject matter before the various meetings.

Programs of the session are being issued in attractive binding and will be printed in the five official languages of the Congress—English, German, French, Spanish, and Italian.

Following the sessions in Washington, the delegates will proceed by special train on a 30-days' trip across country to the Pacific Coast and return to New York. Numerous stops will be made to afford not only a study of the soil regions of the United States and

Young "Bob Whites"—friends of the American farmer. Protect them.

Canada, but also cropping systems and manufacturing establishments allied to the agricultural interests of the country, particularly cotton spinning, fertilizer manufacturing, packing-houses, flour milling, and agricultural machinery.

The itinerary of the trip includes stops in North Carolina, Tennessee, Georgia, Mississippi, Missouri, Kansas, Colorado, Utah, Nevada, California, Oregon, Washington, British Columbia, Alberta, Saskatchewan, Manitoba, Minnesota, Iowa, Illinois, Indiana, Ohio, Washington, D. C., New Jersey, and New York.

Secretary of State Kellogg has appointed 13 delegates to represent the Federal Department of Agriculture and the several state colleges and experiment stations. These delegates have been named as follows: Dr. A. G. McCall, Professor of Soils, University of Maryland; Dr. J. G. Lipman, Director of the N. J. Agricultural Experiment Station, New Brunswick, N. J.; Dr. C. F. Marbut, Bureau of Soils, Department of Agriculture, Washington, D. C.; Prof. R. I. Throckmorton, Head, Department of Agronomy, Kansas Agricultural College, Manhattan, Kans.; Prof. C. A. Mooers, Director of Experiment Station, Knoxville, Tenn.; Dr. F. J. Alway, Professor of Soils, University of Minnesota, St. Paul, Minn.; Prof. W. W. Burr, Chairman, Department of Agronomy, University of Nebraska, Lincoln, Neb.; Dr. G. S. Fraps, Chief Chemist, Agricultural College of Texas, College Station, Tex.; Dr. P. E. Brown, Professor of Soils, Iowa Agricultural School, Ames, Iowa; Dr. W. L. Burlison, Head, Department of Crop Production, University of Illinois, Urbana, Ill.; Dr. C. F. Shaw, Head, Division of Soils, University of California, Berkeley, Cal.; Dr. A. F. Woods, Director of Scientific Work, Department of Agriculture, Washington, D. C.; Dr. Oswald Schreiner, Bureau of Plant Industry, Department of Agriculture, Washington, D. C.

It is hoped that the First International Soil Congress will serve to remind people engaged in all walks of life that the soil is the only absolutely essential inheritage of humanity. The political, social, and educational affairs of the world may be badly managed without causing more than a few ripples in the news items, but the soil is the supreme banking account which must not be overdrawn if man is to continue on the earth.

* * *

Soybeans

(*From page 22*)

clover or alfalfa. However, the land should be limed occasionally in order to keep it from becoming too acid.

In applying fertilizers it is not only important that the fertilizers be applied that will increase the yields but also increase them sufficiently to give a net return above the investment in fertilizers. The value of the beans grown without fertilizer or lime was $35.80 per acre in the Delaware experiments. Significant gains were made by the addition of acid phosphate and muriate of potash. The net returns were $43.27 per acre after the cost of the phosphate had been deducted. Applications of muriate of potash gave a gain of $44.54 without lime, and $54.42 with lime. Combined applications of acid phosphate and muriate of potash gave a gain of $61.01 per acre without lime, and $59.55 with lime. A complete fertilizer and manure gave still larger net returns.

The question as to what fertilizer materials to use is very clear in this case. The problem

AVERAGE YIELD AND NET RETURNS PER ACRE FOR EIGHT YEARS 1916-23 (DEL. EXP. STATION)

Treatment Lbs. per A.	Bus. per A. Limed[1]	Bus. per A. Unlimed	Net Returns[2] per A. Limed[1]	Net Returns[2] per A. Unlimed
No Fertilizer	13.3	12.8	35.59	35.80
Nitrate of Soda (N) 100 lbs.	13.7	14.2	32.67	35.79
Acid Phosphate (P 250 lbs.	13.8	15.5	34.19	43.27
Muriate of Potash (K) 75 lbs.	21.5	16.8	54.42	44.54
N. P. same amounts as above	15.6	16.9	36.02	43.79
P. K. same amounts as above	23.8	23.2	59.55	61.01
N. K. same amounts as above	25.0	22.9	61.09	56.73
N. P. K. same amounts as above.	28.7	27.0	68.48	67.02
Manure 5 T.	27.2	28.7	63.04	68.64

1. 1,500 *lbs. of hydrated lime on corn preceding season.*
2. *N.* \$60.00 *T.; P,* \$16.00; *K,* \$48.00; *manure* \$1.85; *beans* \$2.50 *b'., straw* \$10.00 *T.; lime* \$11.00 *T.;* 35 *cents per A. for spreading lime and fertilizers, and* 6 *per cent on additional investment.*

resolves itself into one of how much have I to invest in fertilizers and what materials are available. If there is plenty of manure on the farm very little if any investment need be made in fertilizers. If no manure is available and only a limited amount of money available for fertilizer materials, muriate of potash is a promising investment. An 0-12-6 fertilizer represents a little more investment but the returns are about \$20.00 more per acre.

Seasonal and market conditions will alter the returns from season to season and for various districts, however, proper cultural treatments tend to stabilize quality and yields.

* * * *

Wanted: A Soil Fertometer

(*From page* 27)

the farm and briefly note the disposition made of the crop grown on each field. Arrangements are always made to market the grain crops and roughage to livestock. In Indiana it is estimated that 87 per cent of the corn crop is marketed through hogs.

Last year I bought \$144 worth of fertilizer, part of this muriate of potash and the remainder high grade phosphate. On a farm this size, a fertilizer bill of \$144 is considered quite liberal. Even the average crop farmer feels that when he puts on this much fertilizer he has met the plant food requirements of his crops and maintained the fertility level in his soil.

In the calculations of fertility left or gone, I took the analysis of each crop grown or feed bought and gave the nitrogen content a value of 20 cents a pound, and phosphoric acid and potash seven cents a pound, figures that correspond very closely with the average prices we pay. We raise hogs and feed considerable tankage. Growing shoats subtract about 85 per cent of the phosphoric acid and potash from tankage and directly or indirectly remove about 35 per cent of its nitrogen. I figure the manure value of the crops raised at 85 per cent of their original phosphoric acid and potash content and 65 per cent of the nitrogen content. Soil chemists say that the figures I use hold only when manures are carefully husbanded. What then must be the loss when the fertility as rep-

resented in manures is allowed to get away unattached!

Any one can make a fertometer for his farm. The first thing to do is to make a sketch of the farm similar to the one shown herewith. The disposition of the crops grown together with the amount spent for fertilizer, and the tonnage of tankage, bran, middlings, and other feeds that have been fed up on the fields give the rest. Tables showing the analysis of the various fertilizers, feeds, and roughages, using the prices and average losses given before, are merely a matter of arithmetic.

Against this fertility account, one should check the plant food that has been removed from the farm in the shape of animals sold. The calculations concerning "Mathews Manor" are not of any particular interest. The salient facts are these—I spent $144 for chemical fertilizers and the plant food contained in the feeds bought brought the total added to the farm to $176.90.

I SOLD 200 bushels of sweet clover seed and about four tons of fat hogs. The direct and indirect losses total $157.49 leaving me a balance of $19.41 which represents how much more plant food I had than last spring. Without my sweet clover and alfalfa adding nitrogen to the soil, all of which I counted in, I would have been thrown for a big loss on the season's business. Of the $157.49 which represents loss, but $30.79 can be counted against the hogs that were sold. The remainder, more than $100 of loss can be attributed to faulty methods of fertility management which are inherent in the American type of agriculture. The plus and minus marks on the fields indicate the additions or subtractions compared with the year before.

West Virginia

(*From page* 14)

a marked beneficial effect of lime.

Red clover and alfalfa are two crops that have received a great deal of attention not only from the stockmen but the general farmer as well. In recent years there have been considerable discussion and difference of opinion as to the relative value of various strains of each of these crops when grown under local conditions. It is hoped that certain experimental work now in progress will aid in answering this question in so far as West Virginia is concerned. White sweet clover and hairy vetch are two other important legumes that are receiving some attention at the Experiment Station. They are being studied primarily from the standpoint of their value as compared with the value of rye and crimson clover for cover crops in northern West Virginia.

AGRONOMIC investigations which are not so closely associated with problems of livestock production have to do with wheat, oats, and buckwheat. Varietal experiments are under way and rate and date of seeding experiments have just been completed with each of these three crops. There are also breeding experiments being carried on. Numerous selections have been made among the more promising varieties of wheat and of oats. A study of the resistance of wheat to scab and of oats to smut is being made with the hope of obtaining forms that are resistant to these diseases and at the same time are high yielders.

Varietal and breeding experiments with tobacco are being carried on in the tobacco growing section of the State. The breeding experiment has for its aim the production of a high yielding to-

bacco which possesses resistance to root rot. Several investigations have also been carried on to determine the effects of various chemical salts on the quality of the leaf.

The physical equipment of the Station includes offices and laboratories in the Agricultural College and five farms near Morgantown which it operates primarily for experimental purposes. It has also two large farms near Wardensville known as the Lawrence A. Reymann Memorial Experimental Farms, which are devoted to breeding investigations with dairy cattle.

* * * *

Manure *vs.* Commercial Fertilizer

By F. J. SIEVERS

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THE use of manure and commercial fertilizers in their application to the soil is an attempt to feed plants artificially. Plants in their nutritional relationships are similar to animals and especially so in that they are exceedingly sensitive and easily influenced in their development by the food supply available to their use.

In the case of many animals nature has recognized the sensitiveness of the organism involved and has taken precautions against the dangers of artificial feeding through supplying the milk, a balanced food of practically constant composition. It is well established that a very large percentage of the high rate of infant mortality can be traced directly to artificial feeding and that many of the nutritional disorders among adults are in large part caused by the artificial preparation of food products. Such preparation may add to the convenience and pleasure of utilizing the product at the sacrifice of a good and healthful balance in composition.

Since plants are just as sensitive to such artificial influence as animals it is, therefore, not surprising if considerable confusion and misunderstanding exist regarding the proper feeding of plants. While such expressions as "there is no fertilizer equal to barnyard manure," "commercial fertilizers will ruin your soil," and "if you start to use commercial fertilizers you will always need to use them," are more or less commonly accepted, they are after all not justified by the results from experience where such materials were used intelligently. Such notions, like other fads which have a certain amount of foundation, if carried to the extreme not only become ridiculous but frequently very expensive and detrimental.

That "there is no fertilizer equal to barnyard manure," may be traced to the fact that all animal

manures are complete fertilizers in that they contain all of the food elements essential for plant growth. Irrespective of what a soil's fertility deficiency may be, an application of manure will hit the weak spot and always do some good even though much of its value may be wasted. Furthermore, manure is the plant's natural fertilizer in that it is in a form similar to that in which animal and plant residues are returned to the soil in nature.

To make manure available to the plant it must either decompose in the soil or otherwise undergo decomposition before it is applied. The factors primarily responsible for the promotion of decomposition, viz., moisture, warmth, and air, are also those that are very effective in promoting plant growth. The result is that when conditions are such that the plant food in manure becomes available rapidly these conditions will also cause the plant to grow rapidly and use the plant food so made available. This makes manure as "fool proof" for plants as many of nature's feeds are "fool proof" for animals. There is little danger of overfeeding or of supplying an unbalanced ration.

That "commercial fertilizers will ruin the soil" and make it unproductive as compared to manure may be traced to the fact that commercial products frequently do not contain all of the essential plant food elements. Let us assume that a certain soil is adequately supplied with all of the essential plant food constituents with the exception of potassium. To increase productivity a fertilizer containing only potassium is recommended and used. As its use is continued the crops grown and removed from the land will tend to deplete the other elements and eventually a time is reached where a potassium fertilizer may no longer maintain yields. The fertilizer should not be condemned on this basis, but rather such results should be interpreted as indicating that the potassium, up to the time when yields began to decline, had been the most economical and effective material to use. Instead of discontinuing further applications as then frequently is done, because of its apparent harmful effects, its use should be continued but supplemented with an application of a fertilizer material containing the other elements of plant food that were depleted in the cropping practice.

That "if you start using commercial fertilizers you will always need to use them," while no doubt founded on a certain type of experience, does not necessarily make it a bad habit to practice. The fact of the matter is that where commercial fertilizers of the right kind are used intelligently their effect is generally so immediate and pronounced, or conversely, the discontinuance of their use where their benefits have once been established becomes so impressive in the decreased crop yields, that the grower is no longer satisfied with his returns unless he can continue the use. Such experience should not condemn but rather endorse the practice.

IN summing up, one might state that clover or alfalfa hay and corn silage, although a complete feed for dairy cows and therefore generally fairly satisfactory, are nevertheless very bulky and inadequate to produce highest milk records because they cannot be digested fast enough. So with barnyard manure, if definite and immediate results are desired the material may be too slow to act, or not properly balanced to produce the results desired in a high grade plant product. On the other hand, concentrated feeds as well

as commercial fertilizers, unless they are complete in that they contain all of the essential elements required for growth, must be used with intelligence and frequently need to be tried out before best results can be assured.

Commercial fertilizers are generally more readily available than barnyard manure and, therefore, need to be applied with more care. Under conditions where their use is thoroughly understood, however, and the grower knows his problem and understands some of the fundamentals of plant nutrition, commercial fertilizers are very commonly much more desirable than the common run of farm manure.

* * *

Time

(*From page 62*)

bile, or a score of graduate students and office flunkies to help him.

Sir Walter Scott, whose manifold great historical novels are noted for their fine diction and excellent finish, must have been an expert in the use of time. He was bankrupt at an advanced age but he plunged in again and by superhuman concentration and steady work managed to retrieve his lost fortune and add to the list of his immortal works. He made it a rule during all those trying years to answer all letters the day they were received. "By breakfast time I had broken the neck of the day's work," was his expression.

Shakespeare, Dickens, Macaulay, Balzac, Schiller, and Dumas—and a host of other authors and poets of other days—were gluttons for punishment when it came to spending their time profitably at the writing profession. In doing so most of them did not sacrifice quality for quantity either.

Nobody wants to go back to those good old days; partly because of the inconvenience, but mostly, I presume (from my own inclinations), because of the hard work.

While I shudder at the toil involved in making those musty moments momentous, I marvel at and envy the energy and nice discrimination with which the best of them managed Old Father Time. They kept the old year busy and no doubt he was pretty worn out and ready to quit at New Year's when his successor came on the scene.

YET when Father Time does his posting at present in the big book at the end of the term, no doubt he finds more strides taken toward marvelous achievements in 365 days in 1926 than he did in his scroll of all the Middle Ages.

I suspect Father Time would like to hang around a little longer nowadays because there is more fun and activity, and his feet don't get so calloused tramping around. We treat the old fellow better and he treats us kinder, too, in spite of the use of cosmetics and patent medicines!

But he simply can't change his speed. He was geared up and sealed to a certain notch eons ago, and nobody has found a way to shift or reverse his machinery!

Time is absolutely impartial. Everybody has his equal share of it. There are twenty-four hours in the day for each and every inhabitant of the earth.

Even the air we breathe is not so evenly distributed in its natural purity as time. Man may get a corner on some natural resource, but he will never have a monopoly of time.

The president and the newsboy, the general and the buck private, the richest man in the world and the poorest coolie in China have their same share of time. Perhaps

the rich man should have more time to study his stocks and bonds, or the coolie should have more time for his bowl of rice; but wish as they may, not a moment's halt in the inexorable march is theirs!

Living in the same age and enjoying the same amount of time, what is the reason for the vast difference we see in its passage over the heads of the rich and poor, the ignorant and the learned, the successful and the unsuccessful?

Chance, luck, opportunity, environment, heredity, education, moral forces, physical qualities, mental attainments—these are said to enter into the question more or less.

Take it this way: Liken time to a constant powerful motor, and the above conditions, forces and circumstances are the power take-offs, the transformers, and dynamos which are applied to time so as to make it count.

Thus we plainly reason that there can be no monopoly of time, which is the magnetic source of the power to do, or the field in which action is vitalized. But there can be at all times, as there has been in all ages, a discriminating application of those elements of life which men may use to harness time for service as it passes.

THE jolly miller who harnessed the flowing river to his glistening water-wheel is symbolic of man using time to advantage. Perhaps the modern thinker may visualize it better by a conception of Niagara Falls roaring to the rhythmic beat of hydraulic turbines. No matter! It isn't the size of the grist that counts.

Punctuality and tardiness are the virtue and the sin, respectively, of all time users.

A man who keeps his time promptly will keep his word; in fact, he cannot keep his word unless he *does* keep his time.

Once a nobleman apologized to George III for being late, saying, "better late than never." To which King George replied, "No, I say better never than late!"

When I was learning the rudiments of newspaper parlance as a printer's devil I wondered why they referred to deceased people as "the late So and So." The grimy old foreman told me that it was because there was such a striking resemblance between a laggard and a corpse.

PROMPTNESS has been a copybook precept and a theme for maxim-makers in all ages: "A diller, a dollar, a ten o'clock scholar"—"Procrastination is the thief of time"—"A stitch in time saves nine"—"Always behind, like a dog's tail."

Barring accidents or traffic jams, the real cause of tardiness in keeping an appointment is either utter selfishness or absent-minded concentration. The one is a sin and the other a weakness. Either or both may lead to bad consequences when time and promises are forgotten.

Despite the poet's choice, I think the words "too late" are sadder and more portentous than the phrase "it might have been." To be sure, "it might have been" is caused nine times out of ten by somebody who was "too late," for a wedding, a good dinner, or the winning of a battle.

We have mentioned the *time-savers* with praise and preached for punctuality. Let's not overlook the other extreme—those who are hurried and harried and beset with the ticking of the "clock on the stairs." These are the *time-shavers.*

This is a large group in America. To this class belong the fellow

who pulls his watch in front of a speaker; the man who is forever honking his auto horn while waiting at an arterial stop; the cad who tramps on your heels coming down stairs; the chap who doesn't wait for his change; and the galoot who shies and dodges off at your leisurely "Good morning."

These fellows never discuss the weather intelligently. They never have a joke to trade, seem to carry a terrible burden of urgent responsibility without time to unload it anywhere, and are absolutely devoid of human companionship. There's one in every office and on almost every farm, and they never catch up to whatever it is they are chasing.

European travelers in America and Yankees sojourning abroad sense this fact in the difference between the way time is regarded in the U. S. A. and over there. We may be a little snappier over here, but even an elastic will break with too much stretching.

Our lesson is to learn that time is to be enjoyed as well as to be fully utilized. We must take more time to enjoy time. After all the *time-shaver* isn't always a *time-saver.*

WE have another class of folks to consider in relation to time. These are the *time-servers.*

The proverbial clock-watcher belongs to this large and dogged group of slaves. You have heard of the mason's helper who was half way up the ladder with a hod of bricks when the whistle blew. He dropped his hod of bricks down three stories, threw his hod after it, and went home to supper. Next morning he had to pick up the bricks and carry the load up again, cheating his muscles more than he did the clock or the contractor.

Public service is full of time-servers. Many a man gets a job because of political salve when he has no actual experience or talent for the position. The only difference is that he watches the calendar instead of the clock.

In fact, there are two main divisions of time-servers. One group is at liberty and the other is in jail. Quite often, thanks to our prison work-shops, the ones incarcerated do more actual productive work than those who are serving time on the outside.

TIME signifies Duration. It varies with conditions and factors to some extent unknown. What does time mean to a mosquito? What does it mean to one of the ancient Cedars of Lebanon or a grizzled bull elephant in the jungles of Ceylon?

The mosquito, the Cedars of Lebanon, and the old elephant differ from man in their relations to time chiefly because they have not measured and limited it by almanacs, clocks, and calendars. The brief existence of the mosquito or the wonderful span of years the others cover are unknown quantities to them. The size, not the age, of the elephant would appeal to the mosquito. The insignificance, not the youth, of the mosquito would provoke the contempt of the elephant.

This teaches us that we should not measure our period of service or limit our zeal by the calendar years that we have spent in life.

Our fate or our foolishness may have crippled us outwardly, but the spark that responds to inner fires is waiting for the tinder—regardless of time.

Coming to this point of hopeful encouragement, I deem it a good place to quit, as *your* time is also valuable, and that other natural element—space—is herein mechanically limited.

LOSING STRENGTH

"An' how's yer wife, Pat?"

"Sure, she do be awful sick."

"Is ut dangerous she is?"

"No, she's too weak t' be dangerous any more."

Rastus: "I hear dey done found de bones of Columbus."

Enoch: "Sho' I never knew he was a gamblin' man."—*Exchange.*

When Edith and Alexander were engaged she said: "I just love to see you smoke that pipe!"

When Edith and Alexander were married she said: "I'd just like to see you smoke that pipe!"—*Life.*

"Waiter! Take this egg away!" roared the elderly diner. "Take it away."

"Yes, sir," said the waiter, as he glanced wistfully at the offending article. "And—and what shall I do with it, sir?"

"Do with it?" the outraged customer rose menacingly from his chair. "Do with it?" he bellowed, fiercely. "Why, wring its neck."—*White Mule.*

IT PAYS TO ADVERTISE

Rufe Johnson's pet hound disappeared. Rufe put the following ad in the paper:

"Lost or Run Away—One liver-colored bird dog called Jim. Will show signs of hydrofobby in about three days."

The dog came home the following day.

WOW!

"Every time I kiss you it makes me a better man."

"Well, you don't have to try to get to heaven tonight."—*Peoria Journal.*

A colored man took out a marriage license. A few days later he went back and asked the clerk to substitute another woman's name for the one on the license, as he had changed his mind. He was told that it would cost him another dollar and a half.

"You mean I got to get a new license?"

"Yes," said the clerk.

The applicant was silent for a few minutes, thinking hard. Then he said with an air of determination: "Never mind, boss, this old one will do. Thar ain't a dollar an' a half difference 'tween them two, nohow."

YOUTHFUL OPPORTUNIST

A very small boy was trying to lead a big St. Bernard up the road.

"Where are you going to take that dog, my little man?" inquired a passer-by.

"I—I'm going to see—where he wants to go first," was the breathless reply.—*United Presbyterian.*

Sailor: "I shay, iz ish a hand laundry?"

Chinaman: "You bettee."

Sailor: "Well, wash m'handsh!"—*Leatherneck.*

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